Reflections on forty years in the management field: a Parthian shot (friendly)

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These reflections, both as a presentation at OR60 in 2018 and here, in written form, stem from many years of professional life spent trying to understand the everyday real world in order to bring about positive changes in real-world situations which are taken to be problematical.

The rich experiences which the above activity provided may be summarised as follows. Four years at Oxford, reading chemistry, which gave me a First but which never led to my working in that field. This was followed by fourteen years as a manager in what was then Britain's largest manufacturing company, ICI, culminating in my managing a one-hundred-strong group of researchers whose role it was to develop new products and processes in the Fibres Division of the Company, based on the polymers nylon, polyester, and polypropylene. Leaving ICI, I joined Lancaster University as Professor of Systems in a postgraduate department. This provided the opportunity to develop, over many enthralling years, what emerged as Soft Systems Methodology (SSM), a widely applicable way of thinking about real-world complexity in order to richly appreciate problems and to bring about changes which are widely accepted as improvements.

In thinking about all of this experience as a whole, I was always aware of the crucial need to find epistemological concepts whose organised relationships could help to make sense of the perceived real-world complexity.

In now examining my intellectual stance on this material, as my professional career comes to an end, it seems most useful to make structural use of two contrasting modes of thought

which are relevant to core ways of thinking, these being holism and reductionism. Within a frame set by these two ideas, what follows describes five bodies of work which can be related to both ideas in terms of how holistic or reductionist the bodies of work are.

1. The emergence of Operational Research

In the 1930s, with Hitler in power in Germany, European politics were dominated by the possibility of a new war. In the UK in the 1930s everyone seemed to know the sombre remark made by Baldwin, the Prime Minister: 'The bomber will always get through'. However, a new technology became available at that time which gave some hope that aerial warfare could, at least partially, be tamed. It was known that radio waves were reflected by solid objects, especially metal objects. The German scientist Hertz discovered this in 1887 and, in the 1930s, both the UK and Germany were developing the possibility of detecting approaching aircraft by the observed reflection of radio waves. Radar had arrived, though it was the Americans who later named it.

The Germans were technically more advanced than the British, but it was in the UK that radar technology was developed for use in the most sophisticated way, based on a first chain of linked radar stations along the east and south coasts of Britain, from the Tyne in the north to Southampton in the south. They used these radar stations to create a radar-based information system which enabled enemy aircraft to be detected as they approached the UK, enabling their progress to be plotted in real time on large physical maps. This then enabled defending fighter planes to be despatched appropriately to meet the enemy. The creation of this information system produced the phrase 'operational research', and this research brought together in one team RAF officers, fighter pilots, and post office engineers who maintained the networked system.

The working of this unique system not only saved the country from invasion, but also impressed the enemy! Adolf Galland, the most successful of the German Messerschmitt fighter pilots during what became known as the Battle of Britain wrote of his experience of British radar thus:

Its success was outstanding. Our planes were already detected over the Pas de Calais while they were assembling, and they were never allowed to escape the radar eye…. British Fighter Command was able to direct its forces to the most favourable position at the most propitious time.

At the time of the Battle of Britain, and in its context, this founding OR project must surely be the best-ever demonstration of OR, at least in terms of impact. Consider: Hermann Goering, head of the German Luftwaffe, had told Hitler that he would be able to destroy the RAF in four days. The RAF's survival over many months then led Hitler to abandon what the Germans called Operation Sealion – the invasion of Britain – and instead he made the crucial error of launching his attack on the Soviet Union, which ultimately led to his downfall.

We in the UK can count ourselves lucky that Hitler imagined himself to be a masterly military planner. Chapter 5 of my book, *Information, Systems and Information Systems (1998)* is a detailed account of the holistic development of the battle of Britain Information system.

2. Operational Research for managers?

The success achieved by OR in the Second World War, in which working teams combined professionals having different backgrounds and modes of thought: military personnel, scientists and engineers, led inevitably to thoughts about the relevance of OR in more general fields, such as the management of organisations. This did not happen immediately, but 1963 saw publication of a short now-forgotten book called *A Manager's Guide to Operational Research.* This was written by Pat Rivett, who established at Lancaster the first postgraduate department of OR in a British University, together with Russ Ackoff, well-known for his trenchant writings in the management field. These authors did not have an overall aim as clear as that of the wartime operational researchers, but they did show some holism in their thinking about OR in the post-war world.

Two themes in their thinking stand out: the desirability of assembling a multi-disciplinary team to undertake OR study, and the assembly of a classification of types of problems which recur. In the book aimed at managers, they urge the creation of multidisciplinary teams, and suggest that consideration be given to the following members:

- A physical scientist

- An engineer

- A mathematician/statistician

- A biologist

- A mathematical economist

- A behavioural scientist

- A cost analyst

As for problem types which recur, they suggest attention to problems related to:

- Inventory

- Allocation

- Queueing

- Sequencing

- Routing

- Competition

- Search

These authors, aware of OR in wartime, were clearly over-optimistic in their thinking about what might be accomplished in the immediate post-war world, but, had their ideas been taken up with some vigour, it would have enhanced the contribution of OR to so-called Management Science, which seems to be largely unaffected by the holism of the wartime contribution made by the OR approach

3. A retreat to reductionism

The first two bodies of work summarised above both entail sets of linked activities, which, as a result of that linking, can be described as wholes. That type of holism might then have been extended, but what happened to OR as a whole at that time was both somewhat

surprising and not helpful. OR in many quarters came to be seen as a group of separate specific techniques, each with its own focus, identity and methods. Many operational researchers chose to focus on a specific technique, such as depot location or queueing theory, while OR as a whole, for many, became simply the name of a bag which contained the various unconnected techniques. University textbooks would then describe the separate techniques a chapter at a time. These techniques of course can be helpful in particular circumstances, but fragmentation seemed to be the fate of OR as a whole.

4. New stories: problem structuring methods (PSMs)

Happily, the fragmentation of OR into separate techniques did not signal the end of the OR story. There then emerged several richer, more holistic approaches to OR in the kind of work now referred to as Problem Structuring Methods – PSMs. This is in some ways an unfortunate name, with doubts about the P, the S and the M. In the real (social) world, problems can never be precisely defined because problems in that world are always 'wicked' problems, always in a state of flux. Secondly, structuring is only a halfway house, the aim not being simply to *structure* the issues addressed, but to bring about change. Finally, 'method' implies a formula known to work every time, such as the method for solving simultaneous equations. The word really needed is not method but methodology: the *logos* of method, that is to say the principles which define the method, which neatly avoids trapping the user in a formulaic or reductionist approach.

The best thing to be said about a PSM, ignoring the inadequacy of the name, is that they are rich enough to convey *stories* about engaging with real world complexity; and readers crave stories. In addition to this, PSMs have allowed the phrase 'Soft-OR' to creep into our vocabulary, indicating a welcome reluctance or refusal to surrender to reductionism. This is encouraging.

5. A unique contribution: Vickers' 'appreciative system'

Geoffrey Vickers, later Sir Geoffrey Vickers, described himself as 'an independent scholar'. Having listened to a talk by him I decided I must get to know him, and my department at

Lancaster appointed him as a Visiting Professor. He was then 84, but more active, intellectually , than most people are at any point in their lives.

This independent scholar was a prolific writer. The 379 page book *The Vickers papers* (1984) assembled by a group of my friends at the Open University, lists 10 books and more than a hundred papers and articles; it also includes a fine 20,000 word account of his life by Margaret Blunden of the Open University.

I have never had contact with a finer mind than that of Sir Geoffrey.

Vickers found systems ideas very helpful in creating an epistemology which would make sense of his main concern: namely, the nature of the social process; that is to say, the ever-changing process which creates the real world of day-to-day life and activity in the human tribe, a flux of ever-changing happenings and ideas which mutually affect each other at all times

Vickers' prose, reflecting his schooling in Latin and Greek, is always extremely well thought out, and finely nuanced. Unfortunately this is not the kind of writing sought in 21st Century Higher education. When the Open University commissioned him to write a book for use on their Systems courses, he wrote his last book: *Human systems are different (1998).* When groups of undergraduate Open University students were asked to appraise the book at weekend meetings, they found the book's density of argument too difficult; the University could not use the book on the intended courses. When I suggested to Geoffrey that systems, which are always a set of relationships, are best represented by diagrams, he said that for him, written prose was the best method pf presentation. He claimed to be unable to read diagrams

I felt the need to try to capture diagrammatically the concept of what Vickers calls the Appreciative System, his idea of the social process. My model of it, which I have found to be very useful as a precursor to any use of Soft Systems Methodology, is illustrated below with a map of the five bodies of knowledge addressed here (figures 1 and 2)

Vickers' core concept sees the social process as containing a two-stranded rope of happenings and ideas, each strand continually affecting the other. He suggests that, as human beings, we perceive and describe, as well as we can, human situations which are of interest and concern. In doing this we make judgements of two kinds: judgements of reality (what is going on here?) and judgements of value (good/bad, acceptable/not acceptable?). These judgements comprise what Vickers calls the current 'appreciative settings' of the system.

Now, judgements can only be made in relation to implicit and/or defined standards, and the sources of the standards used in the social process can only be *the previous history of the system itself,* as life in the human tribe unfolds through time. This exploration of the appreciative settings, and the judgements made about them, will enable ideas about possible change to be made. It may also modify existing standards. This is the point at which I have found SSM-style models to be useful in structuring debate about possible changes; this is done by comparing the activity models with the existing real world activity, in the usual way in which SSM seeks possible changes which meet two different criteria: desirability and feasibility in the situation addressed.

Conclusion

This brief appraisal of some experience in the management field over many years, leaves me surprised at the apparent absence of significant discussion concerning the nature of OR in the literature. At the core of OR are two concepts: *intervention* in real situations; and the *nature* of the real-world problem situations which provide OR's context. You would expect researchers in such a field to develop a tested model of what they mean by a 'real-world problem situation', since its nature will influence each intervention. I know of no such model in the literature of OR, and it would be unfortunate if the general view of OR were to be that it consists of a set of separate unconnected techniques. It would be better to return to its holistic roots, and Vickers' work provides a frame which could be used in that endeavour.

In fact it is reasonable to suppose that the model of Vickers' Appreciative system could, in principle, provide a potential route to developing an overarching methodology which would

place the techniques and methods of OR – including PSMs – in a broader frame, taking account of the wider social and political contexts at work in any given problematic situation. A reformed OR enquiry process could then follow these steps:

1. Focus on some part of the flux of happenings and ideas which is clearly problematical

2. Define the characteristics of the chosen problem situation in terms of its perceived culture and values, remembering that cultures are not manufactured, they grow of their own accord (Ask questions of the kind: is this a reward-seeking or punishment-avoiding culture?)

3. Define the characteristics of the situation in terms of its politics – what is the nature of power in this situation, where it is located and how is it used?

4. Discuss with people in the problem situation if and when any intervention has occurred in the past or might be mobilised now

5. Examine historical changes in the situation and use a variety of OR techniques and PSMs to consider possible new changes in the future. Seek changes which in principle would be both desirable or feasible

6. In the light of 1 to 5, plan and define action to be taken

Finally, in following a reforming process of this kind, it is useful to remind ourselves that wise reformers do not wish to make the world perfect, they only want to make it a little bit better.

Note that the sequence of six points made above enable us, if we take ORas a single coherent whole to be represented as a PSM. This is done in the seven stage model below (figure 3), which I have described as 'OD rethought as a problem-solving methodology'.

the flux of everyday life

time

Happenings

Ideas

o Perceive (selectively)

o Judge
- Reality
- Value
- Instrumental action

o Envisage Desired Relationships

Appreciation

Standards

Standards

Action

Decision to act

Reality (what is the case?)
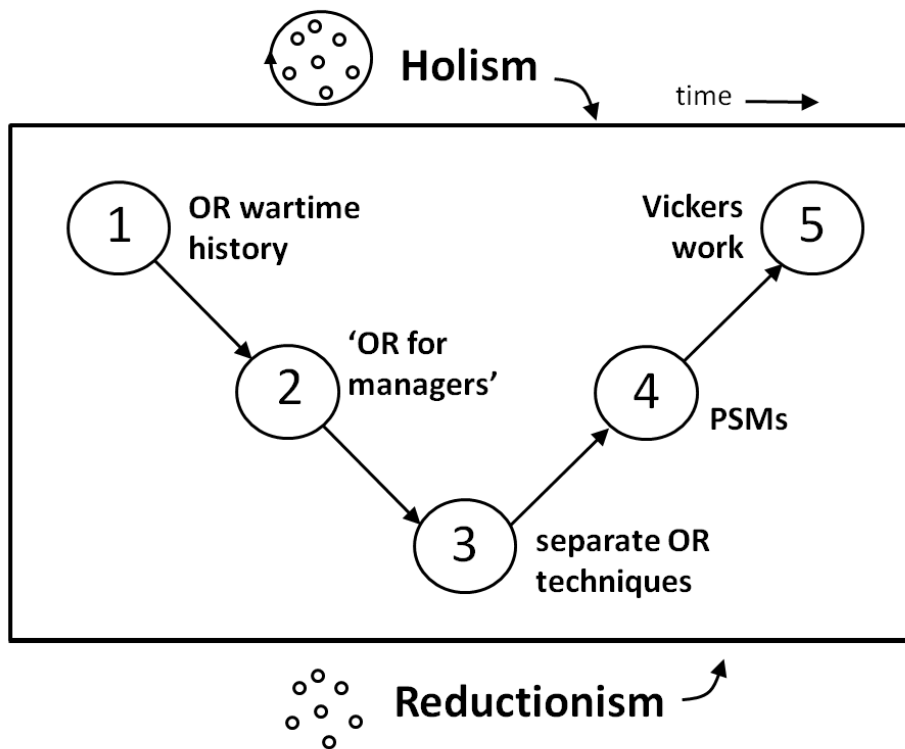Value (good/bad?; acceptable/not acceptable?)
Instrumental (what action to take?)

Figure 3: OR rethought as a problem-solving methodology

the flux of everyday life

time

Happenings

Ideas

Focus on a problem situation within the flux (1)

Define the situation's culture (its nature) and politics (location of power and how it is used) (2)

Appraise the situation's history (3)

Define possible changes, using OR techniques (4)

Consider changes: desirable? feasible? (5)

Plan and define the action to be taken (6)

Take action (7)