Stakes in the Ground: Taxonomy for Analysis of Civil-Military Transitions.

Ian M. Mitchell

East Court
Dstl Portsdown West
England, U.K.
e-mail: IMMitchell@dstl.gov.uk

Ian Mitchell has worked in Operational Research (OR) since 1988, following a flirtation with accountancy. For the Centre for Operational Research and Defence Analysis (CORDA) he initially produced historical data compilations. Studies of the land battle followed until 1992. After two years as an independent OR consultant to the UK Department of Social Security and European Space Agency he joined the Defence Research Agency at Fort Halstead in 1994. He managed the Battle Group War Game, and led infantry studies. He moved to Porton Down in 1998 managing OR studies until 2000 when he was seconded as the OR specialist for the Directorate of Equipment Capability, Nuclear Biological and Chemical (DEC (NBC)). As of 2004 he has supported studies of broader considerations of Chemical Biological Radiological and Nuclear (CBRN) defence. Since 2005 he has worked on naval systems OR studies. Ian served on the Council of the UK OR Society from 1994 to 2000 and 2002 onwards, being Vice-President from 2003 to 2005. He was commissioned into the Territorial Army in 1984 and was introduced to OR as part of a Business Studies degree during 1986.

ABSTRACT

Analysis seeks to inform decision-makers by abstracting the key drivers from a situation. With the increasing complexity of the conflict environment such abstraction is essential to develop understanding. Recent UK experience suggests that the development of a usable comprehensive and understood framework is essential to coherent discussion and analysis of military operations and military capability development.

This environment is now recognised to cover a range of situations and interactions from peace to conflict. Implicit in these views is the role of international military intervention, aimed at recovery back to sustainable peace and stability via civilian intervention. Within the environment a spectrum of activities are undertaken by many agents, some against one another and often ignorant of each other. These bodies have diverse capabilities, objectives and interests. Understanding how they interact is challenging but essential to those decisions seeking to improve the environment overall. Development of a scheme to define the processes on a system basis is essential to such analysis.

This paper considers the definition of the environment for the transitions, their implied nature as crises, and proposes taxonomy describing these. It refers to UK MoD experience of capability development and outputs from the Cornwallis Group. It offers taxonomy for discussion by participants at Cornwallis XI, which may be developed further if it is felt to offer utility.

INTRODUCTION

The range of subjects covered by the Cornwallis Group meetings has grown. The participants from military and civilian operations reflect parties interested in the resolution of societal conflict. These include the military, Operational Analysis (OA, also known as Operational Research, OR) and diplomatic communities. Development of new approaches is enhanced by the diversity of interests and views represented.

The Transitions of a society between states offer crises, in the technical sense of that term. Choices determine whether the crisis leads to an improvement or deterioration of the society. To understand the system as a whole offers the means to better affect it by the decisions taken during the crises.

This paper considers taxonomies as a means to structure the problem space of societal conflict into tractable sub sets with a means to aggregate to an assessment of the whole.

The paper begins by recognition of the scale of the problem space as society and the importance of abstraction to understand it. Considering subject areas it follows on the Cornwallis IX paper on the identity of the components and how they fit together. It relies upon past collaboration at Cornwallis especially the mind map from Cornwallis VIII and Relationships suggested at Cornwallis IX.

Following discussion of Taxonomy theory for use by the Cornwallis Group it reviews past experiences with taxonomies in order to suggest a way ahead.

The paper suggests a descriptive approach to assessing the state of a society, based on a range of outputs. The frequency of incidents of violence both legally sanctioned and on individual initiative is proposed as a part of this primary index of social health. Developing Cornwallis taxonomy may offer a suitable long term project.

PROBLEM SPACE

Any society is a large and complex entity. Even the definition of what constitutes a society is problematic as it is based on the perceptions of observers. Many have no interest beyond their own well being or the advancement of a particular interest or set of interests.

General Zinni's emphasis on studying chains of events rather than their end stages reflects this. He describes "at one end: peace, stability, functioning systems, solid societies. On the other end; conflict, confusion chaos. Crisis fragile or failed societies."

The Cambridge Programme for Security in International Society (C-SIS) sought to help policy-makers improve their long-term strategic vision and thinking in order to provide greater security. Like the Cornwallis Group the Cambridge Security Seminar offered a rare collaboration across government departments, the military, police, academia and the corporate sector, including international delegates. In his closing summary Dr. Anton Obholzer said:

> "…the military will need to engage to a greater extent with other government departments, non-governmental organisations and multinational corporations in a more holistic approach."

This paper recognises the need to mark out the problem area using a common set of references. These are the "stakes in the ground" by which to define an area in a form that it is visible to all those with an interest in improving it.

TAXONOMY IN THEORY

Thomas Hobbes used the analogy of the body political to link the issues in the introduction to his 1651 book "Leviathan". He identified various actors using components of the body as taxonomy based on analogy.

> "For by Art is created that great LEVIATHAN called a COMMON-WEALTH, or STATE, (in latine CIVITAS) which is but an Artificiall Man, though of greater stature and strength than the Naturall, for whose protection and defence it was intended; and in which, the *Soveraignty* is an Artificiall *Soul*, as giving life and motion to the whole body; the *Magistrates*, and other *Officers* of Judicature and Execution, atificiall *Joynts*; *Reward* and *Punishment* (by which fastened to the seate of the Soveraignty, every joynt and member is moved to performe his duty) are the *Nerves*, that do the same in the Body Naturall; The *Wealth* and *Riches* of all the particular members, are the *Strength*; *Salus Populi* (the *peoples safety*) its *Businesse*; *Counsellors*, by whom all things needfull for it to know, are suggested unto it, are the *Memory*; *Equity* and *Lawes*, an artificiall *Reason* and *Will*; *Concord*, *Health*; *Sedition*, *Sicknesse*; and *Civill war*, *Death*.

Hobbes' taxonomy is not amenable to quantitative representation but it does illustrate that even a qualitative analogy can assist in understanding how a society functions. Zinni in 2006 also uses health as an analogy describing how crisis "has metastasized into a major catastrophe".

The nature of the health of Society was discussed in this author's Cornwallis VI paper, using a derivative of Maslow's hierarchy of needs as the basis for a descriptive approach. This offered a single point for a whole society and was again qualitative. The single point metric conceals the multiple levels that various parts of a Society cover. As Friedman has observed even a single business entity, such as Wal-Mart, have multiple aspects to its constituents, in a range of states of health.

The workshop at Cornwallis VIII identified the following as sub-systems.

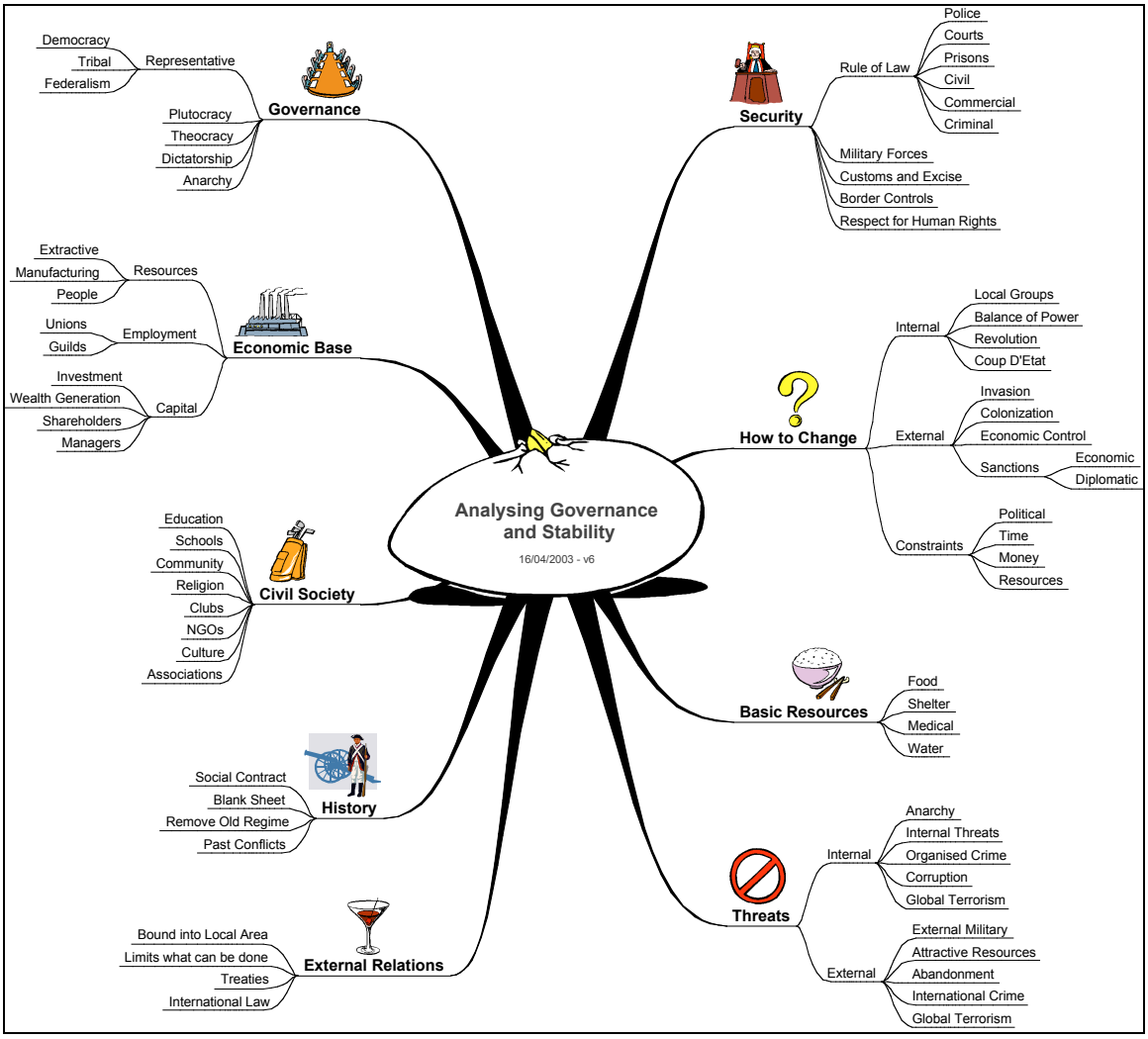

Figure 1: Mind Map of Governance and Stability.

The top branches of the Mind Map suggest key sub systems, from which output measures might be found. These include Civil Society, Economic Base and Security.

Transforming this collection of components into a system depends upon the identification of its purpose. The pursuit of happiness was such a purpose proposed over two centuries ago. Motivational speakers suggest it as the fundamental motivation for all individuals. How individuals attempt to obtain happiness depends on their own values and beliefs.

Returning to Hobbes' Leviathan he suggests violence as a symptom of morbidity. This is consistent with his proposed purpose of his "Artificiall Man", as shown below and emphasised:

> "….though of greater stature and strength than the Naturall, for whose *protection and defence it <u>was intended</u>*."

This definition suggests that incidents of violence may be used as an index of the health of the society. Experience with local government in the United Kingdom supports this view. Police categorise incidents as crimes against the person, property, and public order. The health of a town can be measured by the numbers of these offences.

These metrics feature prominently in police reports to local government. The nature of the crimes in Lambert's description of the assessment of "normality" in the former Yugoslavia differs in the severity of actions. It is a similar means to gather and communicate assessment on a coherent basis. The two are covering societies functioning at different ranges across a spectrum of activity. Hayes *et al.* have also covered the use of numbers of incidents to measure the presence of terrorism and insurgency.

As societies contain many sub-sets there may well be both utopian and dystopian events occurring simultaneously. It is feasible for mixtures of types of incident which the use of the spectrum brings out. An anecdotal example was the legal possession of concealed weapons in the context of a good standard of living in current America. The use of the spectrum rather than a single point aggregated from these is useful.

The question of transitions suggests a broader breadth of the spectrum which should be considered to allow a measure for the state of a society based on the numbers of events. It should also cover positive events if it is to measure the society overall.

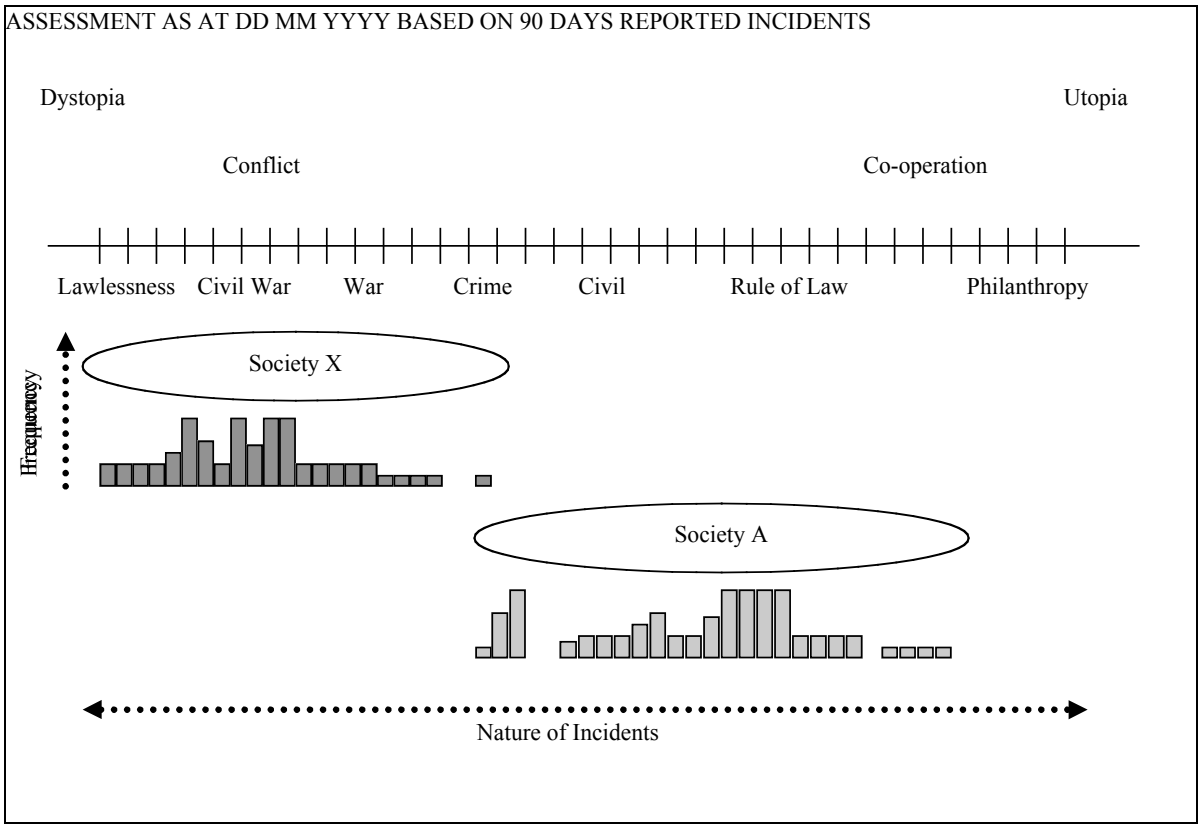

Figure2: Gauging societies by incidents.

The figure illustrates an approach to gauging the health of a society. It follows the note for Cornwallis X, which suggested the utopian to dystopian spectrum. Whilst Utopian Society has yet to be achieved, there are many examples of dystopian societies. This paper extends the idea to the use of a range of behaviours within a Society from only the way in which conflict is resolved. The degree of success may be determined by the higher frequency of incidents closer to the utopian end of the spectrum.

The histograms in the example show frequencies of occurrence of incidents, both destructive and constructive, within defined areas which occur during a given duration. The example shows Society X as a failing state in crisis whilst Society A is functioning well. In A there is some crime but most incidents are resolved within the rule of law. Critically the vast majority of disputes in Society A are being resolved by civil and criminal law rather than the application of violence. The incidents show that Society X has a high level of destructive activities in progress, as seen in Dallaire's description of the massacres in Rwanda during 1994.

There are envelopes of intervention behaviour which will prove effective. Seeking protection from attack by argument, in the manner of court proceedings, will not be effective in Society X. Here, might is right. Intervention operating under the constraints of the peace keeping envelope proved ineffective against those already working further towards the dystopian end of the spectrum in Africa and the former Yugoslavia in the mid 1990s.

In order to render the social scale useful its increments require that there are available data of significance. The following table takes some of the elements from the mind map in order to identify what incidents might be counted and where the evidence might come from.

Taxonomy	**Subset**	**Metric**	**Example Source**
ECONOMIC BASE	Employment	Numbers in Employment Unemployment	Office of Deputy Prime Minister Regional UK Intelligence networks
	Capital	Industrial capacity	UK South West Observations
SECURITY	Rule of Law	Trials -Criminal -- Life -- Person -- Property -- Civil actions	Legal
		Weapons availability	
	Prison	Population	
		Violence - Incidents by severity	-Police reports
		Incidents of sanctioned violence	
		Theft	
CIVIL SOCIETY	Housing	Housing stocks	Office of Deputy Prime Minister Regional UK Intelligence networks
	Corruption	Index	Transparency International
EDUCATION		Population	League tables
BASIC RESOURCES	Food Shelter Medical provision Water	Poverty indices	DSS
Philanthropy	Charitable Spend		Charities Commission

Dr Pauline Baker's description of the Conflict Assessment System Tool (CAST) indicates that there are already means to capture these data. CAST uses them to allow a risk based assessment of susceptibility to state collapse.

A taxonomy to assess when a society has passed thresholds in a set of indicators is essential to recognising whether changes have been effective or not. Finding common measures is key to this being usable by a broad range of actors.

This taxonomy is purely descriptive. To make it prescriptive is a greater challenge. As Zinni indicates it is a challenge worth accepting, in order to make best use of extensive but nonetheless finite resources. The effective direction of the effort is the crux of Packer's New Yorker article on Iraq. Packer contrasts success within the city of Tal Afar with the concerns to the whole enterprise raised by the growth of sectarian violence elsewhere. Packer's article also describes an unwillingness to engage with the necessarily broad scope of operations and to countenance the existence of insurgency. Having a set of agreed terms and recognised processes to describe the operation of a society and its state of health is a worthwhile goal, in that it can force recognition of politically inconvenient reality in time to make effective changes to policies.

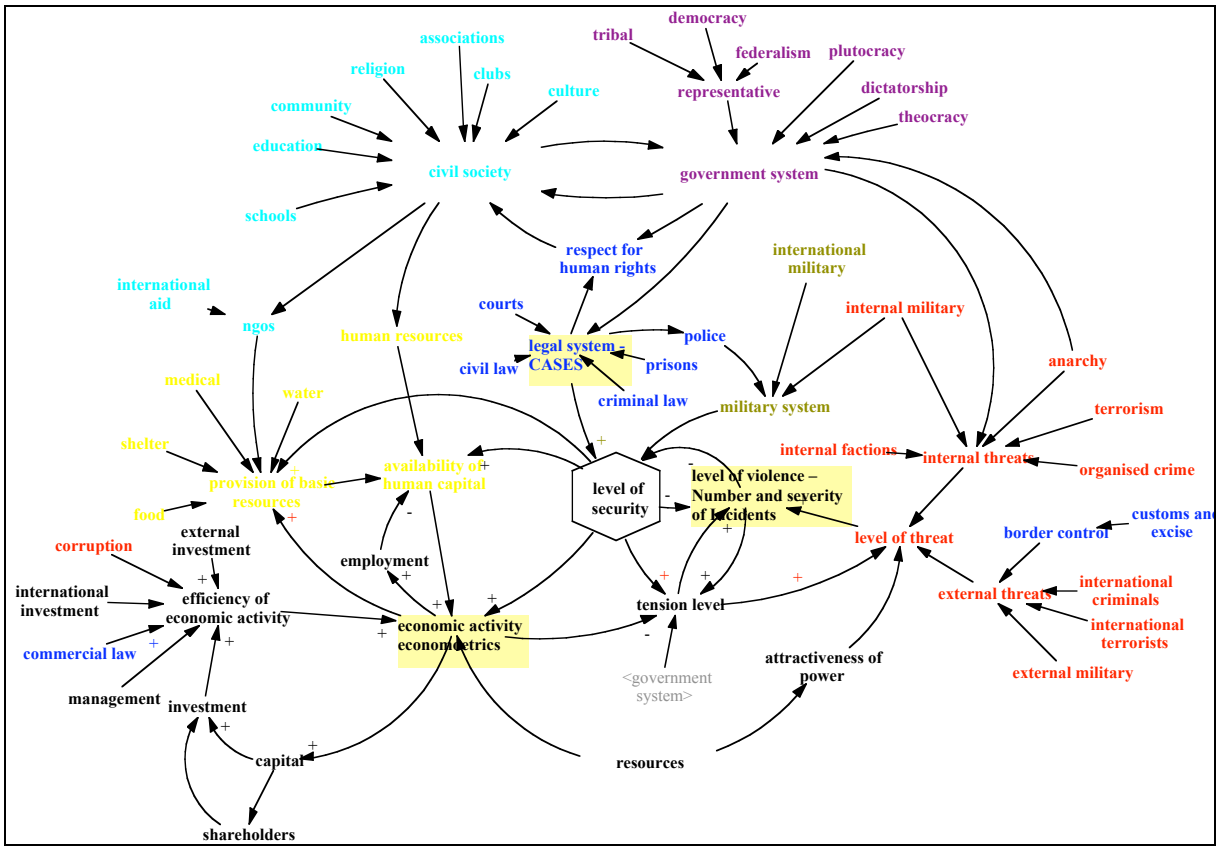

Figure 3: Interactions of Components identified at Cornwallis VIII workshop.

The challenge is centred on the definition of a currency for the causes and effects, which lead to the incidents seen. As suggested in Cornwallis IX, whose theme was Governance and Stability, systems models can be built to represent aspects of these. Packer's article also reminds us of the importance of recognising the limitations of models.

Finding metrics that will be accessible is a key to validation of predictive models. In the example illustrated below these are:

- Legal system – Cases in process.
- Economic Activity – observation by relevant government agencies.
- Level of violence – by numbers and severity of incidents.

The ability to test concepts for society development such as those suggested by Hossack regarding insurgency depends on these. This appears essential to effective implementation, the last step of any OR activity. Much of Zinni's book covers the organisational aspects, particularly the need for integration of organisations from Defence, Industrial, Aid and Diplomacy at strategic, operational and tactical levels in order to generate a coherent approach.

TAXONOMY – EXAMPLES FROM PRACTICE

This section reviews experiences in the development and use of taxonomies in civilian and defence arenas. These are respectively the economic benefits from the European Communications satellites in the 1980s to 1990s and the Capability Audit by the Equipment Capability Customer (ECC) in 2000s.

The first was a qualitative view of the use of the telecommunications satellites in the 1980s to inform the analysis of alternative scenarios with regard to the uptake of technologies. The terms of reference were to consider the economic benefits accruing from the telecommunications satellites. Although expected to be used for telephony these actually supported television broadcasting. The broadcasting system was composed of a diverse range of actors many of whom were ignorant and disinterested in each other. To have a viable satellite broadcasting system depended on them all working adequately in their respective areas.

By identifying how this system worked quantitative metrics could be found for the benefits, and the capacity of the system identified. Experience from this study supports the C-SIS seminar suggestion that personal networks are essential to understanding a system and obtaining data about it.

The ECC was established in 1999 implementing change to the acquisition of equipment capability. Accounting structures had tended to focus attention on individual equipment projects and therefore to the procurement of these in isolation. By moving the focus to military capability a systems engineering approach became viable. Individual Equipment Capability directors constructed their own taxonomies within a centrally mandated structure and reporting format. The taxonomy for the CBRN defence capability evolved between 2000 and 2005.

The initial CBRN Capability Gap Analysis focused on deficiencies in individual equipments, with very limited aggregation possible. The move to Capability Audit demanded the formal definition of taxonomy and a means to assess quantitatively the level of

capability achieved. CBRN defence reduces casualties, which would otherwise be suffered from CBRN attacks, hopefully without causing more casualties through the performance degradation generated by its use. The established terminology of Detection, Warning and Reporting, Physical Protection and Medical Countermeasures offered components of capability, the taxons of the taxonomy. These were therefore assessed as regards each of the three types of challenge.

Whilst some of the components were shared, such as the respirator, there were three systems, mitigating the effects of the chemical biological and radiological challenges respectively. Putting the five components together in respect of each of the three challenges formed the structure for a system dynamics based representation of the system, the Capability System Model (CSM).

CSM allows the implications of interactions within the CBRN defence system so bring out effects arising from combinations of components working together. Use of CSM outputs informed presentations describing the quality of CBRN defence achieved. This met the key Capability Audit question - was the CBRN defence adequate given assumptions on challenges? It also provided diagnostic information, if the system was deficient, suggesting where were the problems lay. This informed subsequent research bids to address the important gaps.

The next evolution was to describe the intermediate outputs of these systems as the generation of Timely Warning, Survival and Sustainment. Use of the Capability Audit taxonomy became established as the normal terms for the stakeholders with which to communicate priorities across the Lines of Development. Recognising the boundaries of the groups and developing means for communication across these enables the development of partnerships based on mutual interest. A common set of terms is a key means of communication.

The ECC Capability taxonomy development demonstrates how taxonomies can be used to improve understanding of the system implications of local courses of action. This promotes coherence and so minimises dysfunctional initiatives. These are founded on local optimised solutions, which are injurious to the system as a whole. The taxonomy also allows communication of the perspectives of stakeholders.

CURRENT DEVELOPMENTS

It is apparent that the perceived scope of analysis is increasing. Two areas in the UK demonstrate this. The first is the formation of a Special Interest Group within the OR Society considering Criminal Justice and the second the Amesbury Market Town Partnership, part of the Market and Coastal Towns initiative.

Prompted by my reference to the 1930s studies of British air defence to improve organisational performance South Yorkshire Police invited me to address the inaugural meeting of a Criminal Justice Special Interest Group in January 2006. The attendance of this covered far more than policing, such as those responsible for providing sentencing guidelines to the judiciary.

It was striking that these groups had none of the supporting doctrine present in the defence field. Development of taxonomy such as that for the CBRN capability offered an analogy for consideration. As Professor Mike Pidd observed at the event thinking of a Criminal Justice World rather than a Criminal Justice System was a fairer reflection of the current situation. The term "system" implied conscious choice and intelligent design. Devising a taxonomy would assist the various participants understand the value of their activities to the whole.

The Amesbury Market Town Partnership (AMTP) offers an even less defined area for study. It is part of the Market and Coastal Towns Initiative (MCTi). This initiative aims to regenerate rural economies by identifying requirements and priming those interested in projects to build better quality of life. This may be seen as establishing new sub-systems and so expanding mutually supporting activities of a society. It has become apparent that many other initiatives with similar aims have been set in motion, some for several years. The results achieved vary. There is far greater turbulence with agencies and individuals and transitory roles than experienced with the military.

AMTP seeks to generate a Local Community Strategy Action Plan (LCSAP) for Amesbury and its hinterland. The term hinterland is deliberately open, allowing the recognition of those groupings and processes which function independently of existing administrative areas, such as parishes, districts or counties. The approach leads to a broad representation of those interested in improving the state of the local society.

Broad consultation is the foundation to the LCSAP. A key test of its validation is the level of consultation achieved. Direct approaches to the public have been made to elicit their views.

Drawing together a diverse range of stakeholders in order to identify courses of action for inter-related but separately directed systems is beyond any of the individual entities, if acting alone. The development of a taxonomy is iterative but even the first attempt develops a common view of the context for these entities allowing better communication between them. Secondly, it supports the identification of the range of feasible courses of actions. The third application is the assessment of these to suggest where the greatest benefit can be obtained.

Hobbes defines science as the "Knowledge of Consequences". This definition appears to describe Operational Research especially well. For the AMTP analysis of the data which it is collecting and exploration of the implications of possible projects is likely to take place in 2006. It will inform the prioritisation of projects within the plan, and prompt invitations to tender to those entities that might be interested in providing the relevant systems and sub-systems. With the plan in place AMTP's focus will then shift to a brokering role for those interested in advancing the projects in the plan, both as suppliers or funders.

THE CORWALLIS TAXONOMY – A WAY AHEAD

Production of a viable sustainable system depends on co-operation between the actors on some level. Its definition to a broad range of interests and actors is required.

The first step is to start with the outputs of a society based on the range of incidents and their definitions, with proposed sources of data.

Cornwallis participants are invited to suggest:

- Data items for the spectrum.
- Data sources for the items.
- Inter relationships between the processes leading to the items.
- Sources for the input data to the processes.

The contributions made to the eleventh meeting of the Cornwallis Group suggest that there are already resources in existence. The Group itself seems to a means to meet Zinni's challenge of "the creation and support of international and nongovernmental organisation cooperation."

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