Chapter 2
Form

Abstract The problems that characterise the maritime sector are constantly developing, and if there is one feature of the shipping and port industry that remains consistent, it is that it is always changing. Apart from the obvious nature of the maritime industry in that it centres upon the movement of goods and people (and consequently ships) around the world, it also displays many other features of constant change. Thus, major maritime problems such as environmental degradation, low safety standards, security violations and issues of commercial efficiency do not stand still but either by nature constantly reflect differing failures or are part of a moving programme of events deliberately manipulated by those central to the industry. The structure and development of maritime governance has failed to reflect this and instead has been characterised by institutional stasis and regulations, and rules and policy directives that are designed for a single point in time. Maritime governance is incessantly chasing maritime problems, failures and inadequacies generated by the shipping industry as it operates to its own strict commercial principles, taking advantage of any anachronisms in policy that have developed since their last revision. Maritime governance needs to address a requirement to be flexible in its institutional structures, in the vehicles it uses to face these problems, in the agencies that deliver the policies that emerge and in the nature of the measures actually taken. There is also a need to understand the difference between the current static governance and the dynamic governance that could meet these needs. This requires at the outset to address the issue of form—a central feature of the static approach to policy that its formal position currently takes. This chapter looks at the static nature of maritime governance and its focus upon form rather than process. It concludes with a discussion of the related concepts of path dependency and lock-in and their relationship to policy-making for shipping.

> Thus, whether presented as elements of a spatial distribution, as unique assemblages of physical facts and human artefacts, or as localized spatial forms, places and regions have been portrayed as little more than frozen scenes of human activity. Pred (1984: 279).

> The tendency is apparently involuntary and immediate to protect oneself against the shock of change by continuing in the presence of altered situations the familiar habits, however incongruous, of the past. Morrison (1966: 9, quoted in Gould 1973: 253).

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The problems that characterise the maritime sector are constantly developing, and if there is one feature of the shipping and port industry that remains consistent, it is that it is always changing. Apart from the obvious nature of the maritime industry in that it centres upon the movement of goods and people (and consequently ships) around the world, it also displays many other features of constant change. Thus, major maritime problems such as environmental degradation, low safety standards, security violations and issues of commercial efficiency do not stand still but either by nature constantly reflect differing failures or are part of a moving programme of events deliberately manipulated by those central to the industry. Shipping is in constant flux and is not best represented by a static profile but by one that reflects the movement of different actors, operating at different jurisdictions where change occurs all the time.

Meanwhile, the structure and development of maritime governance has failed to reflect this and instead has been characterised by institutional stasis and regulations, and rules and policy directives that are designed for a single point in time. Undoubtedly, new policies do emerge over a period of time (e.g. the innumerable attempts at a new maritime framework for the European Union in the early years of the twenty-first century), but in many ways, this just reflects the inadequacies of the current design in that new policies are repeatedly needed to replace those outdated—and instead, it might be preferable if a single but adaptable policy process could be designed which moved with the changes that take place constantly throughout the sector. Maritime governance is incessantly chasing maritime problems, failures and inadequacies generated by the shipping industry as it operates to its own strict commercial principles, taking advantage of any anachronisms in policy that have developed since their last revision.

Given that it is clear that maritime governance needs to address the need to be flexible in its institutional structures, in the vehicles it uses to face these problems, in the agencies that deliver the policies that emerge and in the nature of the measures actually taken, there is also a need to understand the difference between the current static governance and the dynamic governance that could meet these needs. This requires at the outset to address the issue of form—a central feature of the static approach to policy that its formal position currently takes—before moving on to look at change and how this might be incorporated into the governance of the maritime sector. How process can be made part of policy-making; how flexibility can be an inherent feature; how flux, metamorphosis and entropy can be woven into governance and moves made away from the institutionalised paralysis that the current jurisdictional structure represents and the maritime failures that are generated as a consequence.

To understand change, we need first to understand what characterises a situation where there is none. As we shall see, there has been considerable debate in a number of disciplines about how to understand the features that characterise these two situations and which have centred on differences of opinion about the importance of form against that of process and, in other words, of stasis against change or a static approach against that of one that is dynamic. Consequently, we must begin with form and attempt to understand how it relates to contemporary maritime governance.

A Photographic Form of Governance

> Form poses a problem which appeals to the utmost resources of our intelligence, and it affords the means which charm our sensibility and even entice us to the verge of frenzy. Form is never trivial or indifferent: it is the magic of the works. Dalcq (1939).

Despite the miracles of modern digital photography and the flexibility intrinsic to the application of software such as Adobe Photoshop, photographs ultimately remain a snapshot in time—albeit sometimes a false one. Maritime policy is the same. Much—if not all—is just that and applicable at best only to the time it was agreed and regularly out of date before it is even applied. As we saw in the previous chapter, this formal approach to policy-making is one of the major inadequacies of maritime governance and along with other problems stemming from the relationships between globalisation and the nation-state, institutional rigidity and the inadequacies of stakeholder representation and needs to be addressed if there is to be any progress in resolving maritime failure. In fact, it can be seen in many ways as the most important of all these issues as without recognition of the failure of static policy-making, little else can be achieved in improving the other areas of deficiency. So it is to form we must first turn.

Whyte (1954: 23–27, 229–237) provides an extensive historical background to form including a detailed chronology from 2500 BC. His interpretation of the term is wide reflecting the scope of the concept as clearly extensive.

Earliest consideration of form was through the Egyptian flatland to be succeeded by the Ancient Greek concepts of proportion, balance and symmetry. Aristotle's organic forms followed. With Christianity came the desire to continue Plato and Pythagoras's search for a universal form which would transcend the individual as something 'nobler and more lasting' (Whyte 1954: 23). By the time of the Middle Ages, form was reinterpreted as not just a visually perceived shape but as a 'divinely ordered hierarchy of forms'. Figure 2.1 gives some idea of the development of its definition. What is remarkable is the change in attitude to form between 1600 and 1650, from Francis Bacon's declaration that 'the form of a thing is its very essence', to triviality defined as a 'mere formality', merely a matter of form.

Whyte (1951: 2) was the first to note how form had been neglected and that no scientific philosophy existed to act as a guide although as we shall see later the debate about atomism dates back to Democritus and the Ancient Greeks. Gibson (1951: 403–404) examined form from a psychological perspective and considered that there were at least three general meanings of the term, something he termed the 'substantial shape of an object in three dimensions'. Secondly, the 'projection of such an object on a flat surface, either by light from the object or by the human act of drawing creating images, drawings, etc.' Thirdly, there is the 'abstract geometrical form composed of imaginary lines, planes or families of them'.

Whyte (1944: 173–174, 1954: 10–11) further appreciates form and outlines Plato's conception of eternal ideas or universal intelligible *Forms*. Plato suggested that the 'Demiurge' or skilled workman was engaged in making the world and

Pythagoras	Number
Aristotle	Realized form
Euclid	Quantitative relations of space
Aquinas	Determining principle of everything. The mind of God
Leonardo da Vinci Francis Bacon	The arrangement of the spatial parts that make up the whole
Kepler Gallileo Descartes	Scientific measurement. Exactness. The world is built of minute parts and so form becomes less important
Vitalists Gestalt School	A return to the value of the whole (form) rather than the parts
Structure	As a new idea of pattern of relationships including both the minute parts and forms of the world
Atomism	Controls the form an object takes. Simultaneous consideration of both the internal and external configuration
Holism	As a response to atomism, looking at the universe as a system of systems

Fig. 2.1 The meaning of form over time. Derived from Whyte (1954: 23–27)

created all things to be like Himself as much as possible. He thus took from his own real world the forms 'representing the generic idea of everything and used them to make copies in the world of appearances'. This was what Whyte called the 'transient world of phenomena'. Taleb (2007: xxv) was highly critical of this 'Platonicity' with its overemphasis on well-defined forms whether 'objects, like triangles, or social notions, like utopias, even nationalities'. These objects tend to become 'privileged over other less elegant objects, those with messier and less tractable structures'. These include the less tangible and more difficult to grasp dynamic models of governance.

Thus, within every changing appearance, there is an unchanging form that dictates appearance. Whyte goes on to indicate that there are only 20 primary ideas (those that help us to understand the universe) that have ever been produced in the lifetime of mankind of which 12 are dominant (Fig. 2.2). These ideas are the main instruments of intellectual understanding and are all that is necessary to understand virtually everything else. Form is one of them.

Whyte (1954: 14) continues by suggesting that form is one of the more unclear ideas meaning almost anything to anyone, ambiguous and fertile with possibilities. 'Form is the dark horse'. And this is despite its clear significance. The Greek *Eidos*, *Schema* and *Morphe* along with the Latin *forma* all can be translated as form but really just mean 'the qualities that make any thing what it is'. Its significance had been emphasised by Whyte's (1951: 229–237) attempt at a chronology of form which reflects the importance of form as a concept over many millennia. He also cites the example of Leonardo da Vinci who considered all positions of

Number
Space Time
Atoms
Energy
Organism
Mind
Unconscious Mind
Historical process
Statistics
Form
Structure

Fig. 2.2 The 12 primary ideas.
Source Whyte (1954: 11)

the human body—'repose, movement, running, standing, supported, sitting, leaning, kneeling, lying down, suspended, carrying or being carried, thrusting, pulling, striking, being struck, pressing down and lifting up'. Apparently, there are ten types of noses in profile and eleven in full face. These are expressions of form but with clear relationship to process, something that Whyte re-emphasises throughout his work (see, for example, Whyte 1954: 48) and in particular that the forms of every part of the universe are harmoniously related to all the processes that characterised the holistic system.

We cannot leave the issue of form and the historical development of the concept without a few words on atomism and holism (Whyte 1951: 2–3, 1954: 51–54). The diversity in opinion between these two schools is well documented, and we shall spend relatively little time on it here. The disagreements date back to the Ancient Greeks. The atomists are represented by Leucippus, Democritus, Gassendi, Newton, Boyle, Dalton and Rutherford. Holists include Aristotle, Goethe, Bergson, Whitehead and Smuts.

As far as atomism goes, Lucretius's work of 56 BC (Lucretius 1995) provides a detailed philosophy, whilst Smuts' *Holism and Evolution* (1927) gives an opposing view. Atomism asserts that the universe is made up of ultimate particles each of which is indivisible and permanent and any changes which can be observed are simply due to their reorganisation. This idea or complex and frequent movement of indivisible particles neatly brings process alongside form. Appealing to the exact sciences, it remains short of soul and passion.

Holism suggests that the world is made up of hierarchies of unities, each part of a grand order. There is more to change in this system than the rearrangement of particles. Forms are related to the harmonious systems that characterise the hierarchies of unity.

> the 'feminine', artistic, poetic, inventive and imaginative component of human personality uses the… holistic approach, while the 'masculine' analytical, classifying component uses the… atomistic method.

In truth, we all use both masculine and feminine components, whilst both use form and process as part of their analytical framework.

Vogt (1960: 19–20) is sure that the reason why conceptualising process has been so much more difficult than the analysis of structure is because of an assumed 'premise about the nature of human society and culture that defeats us from the start'. The assumption is that cultural and social systems remain in equilibrium unless they are 'hit' by some outside force or develop an internal and unsupportable strain. The scientific model is then to establish how equilibrium is restored. Vogt suggests that this follows a long tradition characterised by Durkheim (1968) aimed at preserving social order.

He suggests we should start with the premise that change is inevitable and that as a result considering society as a focussed equilibrium is purely a convenience, undertaken to help us understand what is going on but in no way representing the reality of change (Leach 1954: 4; Henry 1955; Herskovits 1955: 443–446). Change is always present, and this is just as true in governance, policy-making and every commercial sector towards which these policies might be applied—including shipping.

Van Ginkel (1961: 57) suggests that form as applied to architecture and planning is all about impression rather than detail and that the form of a place or building is the feeling that the observer experiences, largely unaffected by specific design. Forward (1967) provides the example of the Port of St John's in Newfoundland, Canada, as an interpretation of form from a geographical perspective. Meanwhile, Eichenbaum and Gale (1971: 526) take a scientific view of form and find that to do so is confused by the commonplace usage of the word. Taking the dictionary definition as a starting point, they emphasise that form is the 'visible aspect of a thing, usually taken in the narrow sense of shape or configuration as distinguished from such properties as colour'. It often implies a 'value judgement such as orderly arrangement or regularity'.

Furster (1963: 75) looks at form in relation to structure within a geographical context and suggests that form means:

> the physical pattern of land use, population distribution and service networks while structure signifies the spatial organisation of human activities and interrelationships.

Meanwhile, Pitzl (1974: 84) considers the concept of form as intensely subtle and as a result presents difficulties in definition. Quoting Whyte (1951: 2–3), he comments on how form and matter possess a very close relationship but that:

> …it is a remarkable fact that throughout this debate, that is during eighty human generations, no one has suggested how to combine them into one simple and comprehensive way of thinking: hence much of the disorder in thought.

Johnson and Pitzl (1981: 216) comment on how loosely the term 'form' had been applied in geography and as a result taken on an elusive concept suggesting like Whyte (1954: 24) that it has become rather a question of faith. Form is an 'essence, or as a gestalt or whole, or as an idea and ideal, or in a symbolic sense, is subjective and without precise definition' and as such avoids definition. The result was indeterminate terminology with terms used such as shape, figure, structure, pattern order, arrangement, configuration, plan outline and more all used

interchangeably (Gibson 1951: 403). Van Ginkel (1961) emphasises the indefinite nature of form quoting the Augustinian view that 'form is the very mode of existence, the manifestation of being'. It is rather in this context that current maritime governance designed around form can also be seen to be indeterminate and indistinct. Pitzl concludes quoting Attneave and Armoult (1966):

> Relatively few scientists have seriously applied themselves to the problems of analyzing and describing form: these problems seem to have fallen into the cracks between sciences, and no general quantitative morphonomy has ever been developed.

Cohen and Lewis (1967: 1) suggest that it is almost impossible to separate form and function. Form they define as the 'shape and structure of anything', whilst function is 'the natural, proper or characteristic action of anything'. This reflects the difference between form and process that is central to the problems of maritime governance and implies that even if we can move towards a more flexible and changeable approach to policy-making and policy design and application, the features of both form and function will need to be accommodated. Form cannot just be abandoned although its over-domination in maritime governance needs to be addressed. They go on to emphasise morphology as central to form—the 'features collectively, comprised in the form and structure of an organism or any of its parts' compared with function which was 'any quality, trait or fact so related to another that it is dependent upon and varies with that other'.

Lynch (1960: 105–107) outlines in some detail the qualities of form that are significant in terms of design. Many of these gave an indication of the nature of form and in particular its static characteristics including:

- Singularity—including sharpness of boundary, closure and contrast. The distinct opposite of blurring that comes with movement and change.
- Simplicity—limitation of parts, clarity and lacking the distortion that comes with change.
- Continuity—emphasising the continuation of what already exists and placing emphasis on repetition of what has already gone.
- Dominance—of a theme that has been identified in the past.
- Clarity of joint—reflecting the separation of the past from later events and as a result diluting the changes that occur in time.

Kaplan (1996: 143) stresses the significance of place—and indirectly therefore the form or shape of location and its historical connotations, in contrast to development, change and the future suggesting that:

> A place on the map is also a place in history. Rich (1994).

Buttimer (1976: 278) considers that many social science models are both opaque and static and need to be more dynamic to be useful. Her comments in relationship to space are relevant if only indirectly:

> For us, space cannot be reduced to geometric relationships; relations which we establish as if, reduced to the simple role of spectators or scientists, we were ourselves outside space. We live and act in space, and our personal lives, as well as the social life of

> humanity, unfolds in space. Life spreads out in space without having a geometric extension in the proper sense of the word. We have need of expansion, of perspective, in order to live. Space is as indispensable as time in the development of life.

This resonates with May and Thrift's (2003: 2) interpretation of the dualism of time and space where time is seen as the domain of progress and dynamism, and space 'relegated to the realm of stasis and thus excavated of any meaningful politics', with reference to Harvey (1993), Massey (1993) and Hetherington (2003). Pred (1984: 279) concurs suggesting that 'spatial forms, places and regions have been portrayed as little more than frozen scenes for human activity'. Place is an 'inert, experienced scene', and form follows on alongside.

In similar fashion, Hagerstrand (1973) hints at the inadequacies of constraining consideration of issues in human geography to what is effectively form—and neglecting other considerations:

> In a way it is an ironic circumstance that most other quantitative techniques so far applied in human geography seem to be best fitted to deal with the real-world situation of an old-fashioned, stable rural environment where friction of distance is immensely high and the projects related to human action are on the whole strongly repetitive and restricted to compact space-time 'bubbles' which are elongated in time but very narrow in space.

It is the elongation of this space that the move from form to process in maritime governance needs to address.

Not everyone agrees with a focus that is directed towards process and change. In particular, Durkheim (1968: 432–434) cited by Urry (2000: 26) suggests that the important concepts of life lie behind a 'perpetual, sensuous surface flux'. Concepts are considered outside of time and change and cannot move by themselves. 'They are fixed and immutable, and it is the task of science to reveal them, and not to be seduced by the endlessly changing sensations, perceptions and images'. However perhaps such immutable scientific concepts are not the central concern of policy-makers who have to deal with the daily periphery that does change, mutate and metamorphose on a near continuous basis.

Form and Process

> Time is like a river made up of the events which happen, and its current is strong; no sooner does anything appear than it is swept away, and another comes in its place, and will be swept away too. *Marcus Aurelius Antoninus, Meditations IV,* 43.

> There is a perpetual tension between form and process, between object and subject, between activity and thing. Harvey (1989: 6).

Whilst it is easy to treat form and process as rivals, in fact they have been considered closely linked for a very long time. Harrison's contribution (2005: 86) typifies this debate emphasising the intensity of the disagreement that has raged for decades. However, despite the mutual distaste that each camp appears to have for the other, there remains much to tie the two concepts together. In terms of maritime

governance, we have to see whether this link can be resurrected effectively in the way that policies are derived and implemented.

Not everyone was immediately convinced of the importance that process might take over a traditional concentration upon form in science, the social sciences and elsewhere. Wooldridge (1958: 31) for example regarded it as 'quite fundamental that geomorphology is primarily concerned with the interpretation of forms, not the study of processes' although this has to be read in the light of a long-running academic argument with Strahler (1952: 924) who concluded that geomorphology needed to turn to the 'physical and engineering sciences and mathematics' for vitality and that a major part of the study needed to be of processes and their modelling.

Hartshorne (1939: 352) was an early commentator on the relationship between form and process and the need to introduce an analytical and dynamic rather than static approach. Although focussing on geographical studies, his comments are highly relevant across all types of scientific discipline. In particular, he refers to Spethmann's *Dynamische Erdkunde* (1928) in which he suggests that a dynamic view of geography was necessary to replace the static view of most others. In fact, Spethmann was actually proposing nothing new as dynamism was beginning to be accepted already by the German geographical community and that all he was doing was taking a fashionable position. He returned to these issues in later years (Hartshorne 1958: 106) where he stressed the need to incorporate the static, dynamic and chorological throughout scientific study, a view originally derived from the work of Vedova (1881).

Dodge (1935: 335) had long ago emphasised the importance of process to form considering geographical regions where much more than 'static' or 'being' and their 'becoming' to be much more important. Cohen and Lewis (1967: 1) declares that form and function (change, process etc.) were so interlinked that each should be considered a product of or direct response to the other.

Whyte (1944: 51) has much to say on the relationship between form and process claiming that the characteristics of any process are always its forms—the latter being the 'the recognisable continuity of any process'. Some forms may appear to be static, but in fact, this is simply an illusion and they are always characterised by processes at some level.

Whilst Van Ginkel (1961: 57–58) provides extensive examples of the relationship between form and function (process) from urban planning, Eichenbaum and Gale (1971: 525) link form, function and process together and provide an analysis of the metaphysical positions and methodologies that embrace each of these concepts. Form is seen as providing a measurable, geometric description of any phenomenon at a given instant in time. However, when combined with function, a cross-sectional interpretation becomes possible using the characteristics of time as a way of understanding the issues under review. Thus, form requires function to gain any true value, and function similarly requires form. The two become mutually dependent making any governance structure inadequate which is reliant on just the one. They stress that the classical form-oriented tradition may have produced a variety of epistemologies, cosmologies and theologies, as the foundation

has always been the presumption of 'being'. The dominant Greek philosophy was to 'deprecate becoming and exalt being', independence and absoluteness (Eichenbaum and Gale 1971: 528–529).

Toulmin and Goodfield (1962: 47–48) continue emphasising the Greek philosophical approach to the relationship between flux and the unchanging entities that characterised much of their world. This was the problem of 'change' which exhibited three parts.

- For a theory of the natural world to be meaningful, it had to accommodate both the unchanging parts and the flux which could be observed. In other words, stability and instability at the same time.
- How can these theories be designed to be universally applied to all issues, concepts, objects and events? This is particularly difficult when trying to establish detailed and fixed solutions and explanations to objects and events which display flux.
- Physical compared with psychological change. Do we see objects or imagine that we see them? Can we observe change or do we just perceive it?

The Greeks never solved the problems of relating change and form although consumed much energy in debating them.

The principles of the form-oriented tradition have been further outlined by Beckner (1964) and Alexander (1964: 15–46) and are founded upon the 'axioms of substance and causality and the presumption of being' (Eichenbaum and Gale 1971: 528). Following the Ancient Greeks again, 'becoming' was deprecated and 'being' exalted. In Aristotle's view:

> what was altogether immutable and hence immune to influence from others was superior to that which in any way changed or depended on other things. (Eichenbaum and Gale 1971: 529).

Harvey (1969: 423) discusses the role of process in explaining events in a geographical context although his interpretation is equally as applicable across all disciplines:

> All the varied forms of the lands are dependent upon – or, as the mathematician would say, are functions of three variable quantities which may be called structure, process and time.

Using Davis's cycle of geomorphological erosion, he emphasises the role of process in determining form and how the two are interrelated but also questions the use of time as an independent variable separate from this. He cites a number of other examples of geographical models (e.g. Whittesley 1929; Broeck 1932; Taylor 1937) where process is fundamental and time arbitrarily defined as a sequence of events, difficult to measure appropriately. These crude models do, however, remain closely linked to process and change, and although their relationship to timescales is difficult to assess precisely, the drift is clear.

Berry (1973: 3) is quick to emphasise that whatever pre-eminent position form has taken up in analysis, a 'static pattern analysis is incapable of indicating which if a variety of equally plausible but fundamentally different causal processes had

given rise to the patterns… studied'. However, he also stresses that the 'search for some absolutes of form in some geometric sense is understandable' (Berry 1973: 8). The consideration of form alone, however, is not enough and what was needed was a 'continuous intellectual process' that recognises everything lies within a more complex (and changeable) system.

Pred (1977: 210–211) looks at the contribution Hagerstrand (1974, 1976) made through his work on time geography and how he relates the issues of form and process. One major aim was to develop a *contextual* rather than a *compositional* model of human activity. The compositional approach was widely applied across many disciplines and considers how a set of phenomena is divided into a hierarchy of component parts and how they are then combined to form the whole. It focuses upon structure and form and eerily resembles the jurisdictional hierarchy of current maritime governance. The contextual model looks at the situation in which an object or individual is found and the connections between that individual or object and their behaviour. The emphasis is then on structure and process (Hagerstrand 1975). Both models accept that structure is important, but Hagerstrand's belief is that process was much more significant than form.

Kennedy (1979: 552) refers to the American palaeontologist George Gaylord Simpson (1963) who suggests that there are two separate but complimentary parts to scientific explanation—configurational, relating to and/or determined by unique conditions in time and space (and hence in many ways static); and immanent, representing 'unchanging properties of matter and energy and the likewise unchanging processes and principles arising therefrom' (Simpson 1963: 24) (which by definition accepts a role for process and change).

Pred (1985: 338) links form and process when commenting upon place and its determination by the 'unbroken flow of what takes place locally'. Hence, all static forms are in fact just a representation of local processes. Gertler (1988: 152) notes how in geography there had been a tendency for many years for an 'infatuation with form over process, with pattern instead of change and even with description over explanation (Pred 1977; Gertler 1987)'. This had changed substantially since the 1970s so that process and change had now become the dominant ways of interpreting geographical phenomena and had taken the central position within analysis. Problems remained with the inadequate use of 'dynamics' compared with 'statics' but the need to incorporate flexibility and flux was fully recognised. Maritime governance can take much from this.

Gertler (1988: 157) continues by looking at how form and process need to work together as analytical models and uses the capital market and the role of the firm as examples. What he calls the dialectic of fixity and fluidity has a temporal dimension as well. Firms have to commit considerable capital in fixed form (take ships and port facilities for example) in order to have the means of production (ship operations, storage, etc.). At the same time, they need resources and powers to adjust to changes in the marketplace and they never possess full information about the future conditions in which they must operate. Policies need to accommodate this dialectic as well with the ability to accept fixed form within the industry and incorporating mechanisms to change over time as circumstances change

around them. At present, only the former is allowed for to any real degree and the shipping industry finds ways of manipulating maritime policies by focussing upon the fixed elements and ensuring that the more dynamic features are either minimised or excluded altogether.

In more modern times, Goodchild (2004: 709) identifies in geographical studies an historic tension between form and process and suggests that the focus on scientific methods had led to this being intensified. Rhoads (2005: 137) is more positive viewing process and form as always interactive and not in adversity. The operations of process will always cause some forms to change (if only temporarily), and in return, the changed form will affect the operation of the process. This may not necessarily lead to a changed form or process but may just maintain a situation as it stands. This does not lessen the importance of either feature (form or process), and in some ways, their interdependence becomes that much more significant.

Neo and Chen (2007: 1) emphasise how even if the principles of policy-making are good, static governance would lead to 'stagnation and decay' and the effectiveness of organisations would be challenged if there was insufficient innovation and change designed within institutional capacity.

Path Dependency and Lock in

> But you must bind me hard and fast, so that I cannot stir from the spot where you will stand me… and if I beg you to release me, you must tighten and add to my bonds. *The Odyssey* quoted in Strotz (1955/1956: 165).

> Every action of theirs, that seems to them an act of their own free will, is in historical sense not free at all, but in bondage to the whole course of previous history. Leo Tolstoy, *War and Peace*.

> Spatial form as 'outcome' (the happenstance juxtapositions and so forth) has emergent powers which can have effects on subsequent events. Spatial form can alter the future course of the very histories that have produced it… One way of thinking about all this is to say that the spatial is integral to the production of history… just as the temporal is to geography. Another way is to insist on the inseparability of time and space, on their joint constitution through the interrelationships between phenomena… Massey (1992: 84) quoted in Martin and Sunley (2006: 409–410).

Finally, we turn to a consideration of a concept that has gained in popularity over the years and which has a close relationship to the form and the domination that it has within governance as applied to the maritime sector. Path dependency has a wide range of literature associated with it (see, for example, North 1994: 365; Mueller 1997: 843; Goldstone 1998: 834; and Ramanath 2009: 67, 70), as has the linked theme of lock-in to which we turn a little later.

Definitions abound. Antonelli (1997: 643–644) suggests that:

> path dependence defines the set of dynamic processes where small events have long-lasting consequences that economic action at each moment can modify yet only to a limited extent. The trajectory of a path-dependent process however cannot be fully anticipated

> on the basis of the original events. Path dependence is different from past dependence because the former is able to accommodate the consequences of actions at each point in time. Path-dependence analysis is systemic and dynamic because it focuses attention on the process of change that is generated by the interaction of a plurality and variety of agents whose behavior is constrained by their localization in time.

Antonelli's comments are interesting as they focus upon the dynamic capabilities of path dependency and consequently its application to understanding the static nature of maritime governance, and its need to become more dynamic is clear. Altman (2000: 128) spells it out with a little more detail whereby:

> the free market typically generates suboptimal long-run equilibrium solutions to a variety of economic problems and the probability of suboptimal equilibrium outcomes increases where increasing returns (positive feedbacks) prevail.

Thus, in the free market shipping industry, suboptimal solutions commonly prevail because to those involved (operators and policy-makers), there exists considerable positive feedback in retaining the status quo. Those affected by this suboptimality in policy-making and implementation—clients, the workforce, the economy in general, the environment, are less fortunate. Dopfer (1991: 540) had earlier put it rather more simply:

> The probability that individual agents adopt an idea, such as an invention, transaction, or other behavioral pattern (or maritime policy), will increase as that idea is adopted. There is a determinate relationship between past and present actions. An initial idea is seen to constitute some sort of 'seed' that grows by the self-generating dynamics of the process. Individual behaviors receive increasingly the status of a norm… that determines individual behavior. (comments in parentheses added).

Hence, both maritime policy-making and their governance have become institutionalised, difficult to amend and find it increasingly impossible to accommodate dynamic features. Path dependency does not suggest that the choice of decisions can be predicted precisely, and thus, the future selection of maritime policies is not fully determined; however, they are heavily constrained by what has gone before and what is convenient to those in the established positions of governance (Bruggerman 2002: 415).

Other definitions abound. Liebowitz and Margolis (1995: 205) emphasise how an initial decision that provides an advantage to those taking it can have significant implications for their position in the future. Thus, change is difficult. Mahoney (2001: 111) and Scott (2001: 367) along with Webster (2008: 61) and Foray (1997: 735) provide further definitions, whilst Martin and Sunley (2006: 399) suggest it reflects an inability of organizations to 'shake free of their history'. Meanwhile, a more general consideration of path dependency has been extensive including early work by Veblen (1915: 130), Frankel (1955) and Kindleberger (1964), and more recent contributions by Atkinson and Stiglitz (1969), Arthur (1989, 1990), David (1975, 1985, 1987, 1990, 1994), Farrell and Saloner (1986), Alexander (2001), Arrow (2000), Berman (1998), Cowan and Gunby (1996), Garud and Karnoe (2001), Greener (2002a, b), Hansen (2002), Hedlund (2000), Holzinger and Knill (2002),

Mahoney (2000: 507), O'Brien (1996), Pierson (2000), Putnam (1993), Sterman and Wittenberg (1999), Torfing (1999, 2001) and Wilsford (1994).

Path dependency has a long history, and along with the sizeable array of reading, this implies that it has some substantial credibility. Martin and Sunley (2006: 397), for example, trace the origins of path dependence back to Carl Menger and Veblen's 'cumulative causation' and the rise of 'hysteresis' as a related concept through the work of Elster (1976), Franz (1990), Cross (1993) and Katzner (1993). Those who emphasise its significance include Arrow (2000: 178), Bridges (2000: 109) and Pierson (2000: 251). However, there are also those who play down its significance as a concept. Levi (1997: 27) for example suggests that:

> Path dependence does not simply mean that 'history matters'. This is both true and trivial. Path dependence has to mean, if it is to mean anything, that once a country or a region has started down a track, the costs of reversal are very high. There will be other choice points, but the entrenchments of certain institutional arrangements obstruct an easy reversal of the initial choice. Perhaps the better metaphor is a tree, rather than a path. From the same trunk there are many different branches and smaller branches. Although it is possible to turn around or to clamber from one to the other - and essential if the chosen branch dies - the branch on which a climber begins is the one she tends to follow.

Others with a critical opinion of path dependency include Dopfer (1991: 541) who was uncertain because 'the shortcoming of the present model is that it leaves undefined the process components that constitute the *seed* from which a macroscopic process may emerge'; and Altman (2000: 130–131) who cites Leibowitz and Margolis's (1990, 1994) suggestion that the related assumptions of 'inefficient equilibria' that are implied by path dependency (e.g. the inertia apparent in the IMO which whilst recognised as inefficient is seemingly unchangeable) are untenable. Much has been written about inefficient equilibria, self-reinforcement and increasing returns which we will pass over here (see, for example, the work of Altman 2000: 127, 129, Arrow 2000: 175, Pierson 2000: 252–253, Mahoney 2001: 114, Chen 2004: 434, 437, Levin et al. 2012: 135).

Meanwhile, further criticism comes from Bridges (2000: 111):

> It is a mistake to understand history as a series of cycles in which social and political processes 'are prone to consolidation or institutionalization' in arrangements which then 'reproduce' themselves until new conditions 'disrupt' or 'overwhelm' them. For one thing this reading leaves us content to recognize stability, but condemned to surprise at change.

Mahoney (2000: 507) describes it as a 'vague concept', and consequently, it is unclear why it demands special attention, founded on the idea that 'history matters' and that explanation can be based on tracing events back to 'temporally remote causes'. Hansen (2002: 270) notes others' suggestion that path dependency is little more than a 'rich metaphor for policy continuity' and Scott (2001: 367) continues the themes we noted earlier introduced by Liebowitz and Margolis (1990: 4), whilst Martin and Sunley (2006: 404–408) raise a series of questions including the uncertainty that surrounds the causes of path dependency, the lack of discussion of path creation that follows from this, the lack of theory to support the concept and whether it is an evolutionary process? They note the debate that has

raged through the work of Bassanini and Dosi (2001), Hirsch and Gillespie (2001) and Castaldi and Dosi (2003), amongst others.

Examples abound of the application of path dependency from a multitude of disciplines. The application of path dependency to maritime governance would be based on a good tradition of attempting to model the difficulties of change and the tendency for institutions, organisations and policies to be dogged by inertia. Arthur (1994: 82, 93) uses video cassette recorders and clocks to illustrate the applicability of the model, Antonelli (1997) focuses upon industrial organisation and Hedlund (2000) upon Russian economic policy-making, whilst Pierson (2000: 251) notes its use for comparative politics in Europe (e.g. Lipset and Rokkan 1967), labour incorporation in Latin America (Collier and Collier 1991), state building (Ertman 1996), and health care (Hacker 1998). Hansen (2002) meanwhile suggests its applicability to immigration studies, Greener (2005: 63) cites Alexander's (2001) work on democracy, Dimitrakopoulos's (2001) examination of European integration and Berman's (1998) study of political action in times of economic depression. Martin and Sunley (2006: 398) provide an extensive review of path dependency generally and in doing so refer to examples from social behaviour (Anderlini and Ianni 1996; Goldstone 1998), power generation (Cowan 1990; Cowan and Hulten 1996), industrial technology (Ruttan 1997; Araujo and Harrison 2002), corporate governance (Bebchuk and Roe [no relation] 1999) and legal systems (North 1990). Webster (2008: 61) also suggests studies of tax rate policy (Kaplow and Shavell 2002), sulphur emissions capping (Ellerman et al. 2000), money supply (Dixit 1991) and resource extraction (Gerlagh and Keyzer 2004). In addition, there are also examples of application of path dependency to transport and in particular railways and canals. David (1985: 336) cites the problems of the UK's undersized railways which became set from the earliest development and never readjusted to the larger size common elsewhere across the world. Today, the UK retains small-scale rail (and canal) infrastructure which inhibits both freight and passenger movement simply because the path taken at the start is too difficult to change.

The relevance of the concept to the mobilisation of maritime governance which we have been pursuing is clear when you take the association of path dependency to a number of the concepts which are pursued later in this book. These include those relating to institutions—see, for example, the work of Mahoney (2000: 515, 2001: 114), Dimitrakopoulos (2001: 408) and how institutions are often self-perpetuating, Bruggerman (2002: 417) and institutional inertia, Hansen (2002: 270), Greener (2005: 62) and his consideration of historical institutionalism, Martin and Sunley (2006: 402) and their discussion of institutional hysteresis and Webster (2008: 61). There are others who have focused upon policy-making, governance and path dependence including Mahoney (2001: 111) who reflected on path dependency's ability to contribute to political analysis, Cashore and Howlett (2007: 532) who noted the policy implications of path dependency considered by Hacker (2004), Mahoney (2000) and Pierson (1993, 2000: 259, 268), Ng and Pallis (2010: 2150, 2151) who placed the inertia in institutions and its effect on governance in the ports sector within a path-dependent context, Robichau (2011: 117) who cites

Kjaer (2004: 204) in emphasising the close relationship that exists between governance, change and path dependency and Levin et al. (2012: 124) who look at the ability to use path dependence to ensure policy outcomes.

Meanwhile, path dependence and its relationship to process (Pierson 2000: 252; Martin and Sunley 2006: 408; Levin et al. 2012: 134), time (Pierson 2000: 251) and space (Oosterlynck 2012) have also been common themes.

And so to lock-in, Redding (2002: 1215) notes that innovation is path dependent: 'the historical pattern of technological development is thought to play a central role in determining the pace of future technological change'. Taken to its extreme, this can result in lock-in when 'agents continue to employ an existing technology even though potentially more productive technologies could be found' Redding (2002: 1215) a concept first introduced by David (1985) and Arthur (1989). Maritime governance exhibits just this sort of characteristic. Although taken from a political and governance context rather than technological, the similarities are clear. An old model continues to be applied despite recognition that circumstances have changed and a new one is needed (and potentially available).

Lock-in has been widely considered. In broader terms, it has been the focus of work by Arthur (1994: 82, 92), Kline (2001), Hansen (2002: 271), Martin and Sunley (2006: 414–415), Marechal (2007: 5187) and Levin et al. (2012: 134–135). Examples of application amongst very many others can be found in David (1985: 333–336), Liebowitz and Margolis (2012: 125) with their consideration of QWERTY and the typewriter keyboard; Arthur (1989) and Cowan (1990) on nuclear power, Cowan and Gunby (1996) and Cowan and Hulten (1996) on pest control; Visser and Boschma (2004) on regional economic clustering; Hassink and Shin (2005) and the impact of political lock-ins on industrial production citing Hamm and Wienert (1989), Unruh (2002) and carbon lock-ins; Hassink (2005) on regional economics; and Marechal and Lazaric (2010: 104, 108) on climate change.

A true appreciation of lock-in has much to offer to maritime governance in that the current institutional freeze appears to be an excellent example of how inertia and previous decisions can lead to a widely recognised but seemingly unalterable state of suboptimal affairs (Alexander 2001: 254; Hassink 2005: 523–524; Marechal and Lazaric 2010: 107; and Martin and Sunley 2006: 419). Consequently, the form that maritime governance takes remains divorced from the dynamism that would also appear to be essential if it is to be effective in forming a framework for policy-making.

Conclusions

The relationship between form and process is complex, and it is not just a simple matter of one replacing the other. Werlen (2004: 154) stresses how 'space is losing its importance' and continues to suggest that space 'does not exist at all'. Undoubtedly, process has much to offer to maritime governance, but form will remain an essential element—laws, policy-documents, recommendations, papers,

electronic communications, ships, port facilities and much more—the list is almost endless. What would be different is an approach, an attitude to the application and design of policy that requires a sea change in underlying governance. The significance of moving away from static models has not been lost in many policy-making areas and this in turn makes the situation found in the maritime sector that much more unacceptable where shipping by its very nature and global context requires a flexible, mobile and adaptable approach to governance. The failure of static policy-making was not lost even on Mahatma Gandhi who refused to build any models of an economic situation because they all become static over time. His response was essentially dynamic, characterised by open-ended concepts amendable to any situation (Sethi 1985: xxiv).

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