SCALE, PROTECTIONISM AND EUROPEAN INTEGRATION: THE STRUCTURAL DYNAMICS OF STRATEGIC CONTROL IN A TURBULENT FIELD

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PREFACE

Research work on "Problems of Scale" was started at IIASA in January 1978, in the Management and Technology Area. As was pointed out in an IIASA Research Memorandum in September (Cantley and Glagolev, 1978), the subject of scale can be, and has been, discussed at many levels and in the language of many disciplines. This paper represents one of the several directions of development of this work. Others will be discussed at the June 1979 IIASA workshop, "Scale and Productive Efficiency--The Wider Implications".

In disciplinary terms, the paper is concerned with long-term strategic planning. It was prepared for an Operations Research Congress, but takes a broad interpretation of the scope of "O.R.", and includes reference not only to strategic planning but national industrial strategy, the economics of international trade, and the economic and political aspects of supra-national trade groups such as the European Communities.

Although set in terms of the specific contemporary problems of economic growth, unemployment and regional imbalance in Western Europe, there are clear implications for the management and control of other large-scale connected systems.

ABSTRACT

The first half of the paper introduces concepts useful in the application of O.R. to strategic problems. "Structural dynamics" concerns the lead times for strategic adaptation, the planning horizons implied and the "instrumental" approach to maintaining adaptive capability. "Strategic monitoring" is required for long cycle societal learning and control. Models of the causal texture of the environment have been developed by Emery and Trist, including particularly, the "turbulent field".

These concepts are applied in the second half of the paper to the resolution of two contemporary issues in European integration: economic expansion to maintain employment, and problems of polarization and regional imbalance. The deficiencies of the liberal free trade model are discussed, particularly its neglect of the effect of cumulative dynamic economies of scale. The re-adoption is advocated of national control over aggregate inward trade flow, as a means of resolving the "convicts' dilemma" situation of tightly inter-connected and interdependent national economies. The recommendations are related to neo-functionalist theories of political structure, the intention being not to criticize the concept of the European Communities, but to suggest that more analytic and strategic consideration be given to the location of functional responsibilities--including those for economic management--at appropriate level within the system.

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1. INTRODUCTION

1.1 Can O.R. Embrace Strategy?

The definition of Operational Research as research into operations has the merits of brevity and historical validity. Within the military context of O.R.'s origins, however, "Operations" are a class of activity distinct from "Strategy", and generally more limited in terms of the time, space and scope of resources and activities encompassed. "Research into operations" has a good down-to-earth ring of practicality and dirty-handed involvement. In the words of an early and successful practitioner (of both tactical operations and grand strategy)

> "If you want to acquire knowledge you must take part in the practice of changing reality.
>
> If we have a correct theory, but merely talk about it, lay it aside, and fail to put it into practice, then that theory, however good, has no importance.
>
> Knowledge begins with practice, reaches the theoretical level through practice, and then returns to practice." (Mao Tse Tung, 1937)

However, the development, execution and control of strategy are matters no less practical than those of operations, though there be less dirt under one's finger-nails to prove it. Gadsby (1965) has described how within the post-war military context of the U.K. Army Operational Research Establishment, the role of the operational researchers was progressively accepted at the various levels of activity from tactical to strategic. Although the validation of one's hypotheses, the

practical testing of one's model, may take longer, the same quantitative and analytical habits of mind should in principle be of value in the strategic context of corporate and national planning, and are indeed increasingly being so accepted in companies and in government departments.

Lest it be thought that we seek to be non-controversial, let us remind ourselves of the modest way in which a former president of the O.R. Society of America, Charles Hitch (1957), denied the relevance of his discipline to broader issues:

> "I would make the empirical generalization from my experience at Rand and elsewhere that operations research is the art of sub-optimizing, that is, of solving some lower-level problems, and that difficulties increase and our special competence diminishes by an order of magnitude with every level of decision-making we attempt to ascend. The sort of simple explicit model which operations researchers are so proficient in using can certainly reflect most of the significant factors influencing traffic control on the George Washington Bridge, but the proportion of the relevant reality which we can represent by any such model or models in studying, say, a major foreign-policy decision, appears to be almost trivial."

This quotation was used by Lindblom (1969) in his classic defence of what Simon and Ackoff would term satisficing: the practice of muddling through, of making successive incremental decisions in the light of current pressures, and of forswearing anything so academic, impractical and inapplicable as a theory or a model. One might answer Hitch by enquiring whether the track record of U.S. foreign policy evidenced a greater mind, a grander grasp, or the application of a more effective discipline, than might have been achievable by a scientific approach based on research into operations. By which I do not mean Pentagon acronyms, but the formulation of attainable policy objectives based on empirical observations and deduction; the sort of approach whose successful application in Malaya was described by Sir Robert Thompson (1966). The sort of approach which, had the U.S. foreign policy makers paid attention to the local observations of their own South-East Asian staff in 1945, could have avoided the subsequent vast and ineffective squandering of resources, and suffering; the May 1972 hearings of the Fulbright Committee contain illuminating details (Committee on Foreign Relations, 1972).

This argument is an old one, but worth reiterating. The quotation from Hitch was in fact his dissent from the earlier advocacy by Ackoff of O.R.'s potential contribution to national planning, particularly in underdeveloped countries such as India (Ackoff, 1957). In his subsequent rejoinder, Ackoff (1958) pointed out that Hitch's approach was intrinsically conservative, and argued that

> "if operations researchers were restricted to problems on which current operations-research techniques, narrowly defined, were applicable, at least half the problems that have been attacked by OR would not have been looked at, and at least some of the more important of these techniques would never have been developed. It has always seemed to me that part of the special competence of OR practitioners is the ability to develop suitable techniques for at least some problems for which existing techniques are inadequate."

The need Ackoff refers to for the development of techniques certainly exists in many contemporary strategic problems, and it is that challenge which we seek to take up. Against Lindblom's dismissal of theory, one must surely set Keynes's observation that when business leaders congratulate themselves on being down-to-earth practical men, they are usually acting under the dead hand of some long-deceased theoretical economist.

Tocher sums it up admirably in pointing out (1970) that "at the heart of every decision there lies a model. This may be very rudimentary; its existence may not impinge upon the consciousness, but without it control is impossible." And the strategic decisions have to be made, are made, by default if not by deliberation. On whose models are the strategic decisions to be based? Economists, political scientists, military strategists, newspaper editors or artists? It is the long-term more than the short which most requires the inter-disciplinary approach, because of the former's greater scope for imbrication of the paths of compartmentalized activity.

It is appropriate therefore in this conference, and in this interdisciplinary assembly, to consider some of the strategic aspects of European integration, the policy models which underly them, and the mechanisms of strategic control.

1.2 Structure of Paper

In the spirit of Mao Tse Tung's words about theory and practice, we shall mix both in what follows. Strategy concerns the relationship of a purposeful system with its environment, and we start by considering the structural dynamics of this relationship. Big ships turn slowly, and must therefore look further ahead; "structural dynamics" could be described as a concern with turning circles, rocks, and collision avoidance procedures. This theoretical treatment is then linked to "strategic control", a pair of words too rarely connected. Modelling the environment in which these activities are practised, we complete our conceptual tool-kit by borrowing from Emery and Trist (1965) their ideal types of "organizational environment", particularly the "disturbed reactive" and the "turbulent field".

Thus equipped, we try the tools on one of the central conceptual strategic models of the current drive for European integration, and suggest its revision. The whole tale being

not so much a paradigm as a parable, which the reader/listener may view as David and Goliath, or Don Quixote and the windmills, according as his taste and fancy dictate.

2. STRUCTURAL DYNAMICS, STRATEGIC CONTROL AND TURBULENT FIELDS

2.1 Structural Dynamics: Time Horizons and Timeliness

The time-scales considered relevant to purposive planning do not appear to have been intensively studied from a comparative viewpoint; and yet the choice of planning horizon is a reflection of two key assumptions. Firstly, it reflects an assumption about the internal dynamics of an organization or a system--how quickly it can achieve internal change, redeployment and redisposition of its forces and resources. Secondly, it reflects assumptions about the rates of change of the relevant factors in the environment. Indeed, these two sets of assumptions are only the diagonal elements in a 2x2 matrix whose off-diagonal terms are the assumptions about rates of change of the each way relationships between the organization and its environment (Emery and Trist 1965).

The relevance of these assumptions to the choice of planning horizon is illustrated by Figure 1. An organization forecasts or assumes the possibility of certain relevant future events (shown as E_1, E_2, etc.). To each event, it can formulate an appropriate response. To produce the appropriate response for E_i requires a reaction time t_i. Ideally a planning horizon T has to be chosen sufficiently far ahead that, prior to T, no events E_i are expected to arise to which the organization cannot respond appropriately within a time t_i shorter than the interval from now to the occurrence of E_i. Thus if the class of relevant events includes "market opportunities", and the relevant responses are "product development" or "capacity expansion", the lead times for these processes will be relevant to the determination of the planning horizon.

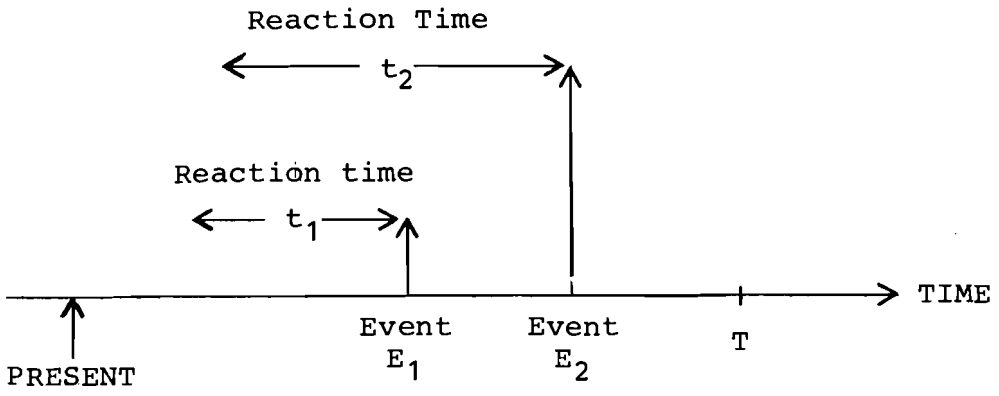


Figure 1: Determination of Planning Horizon

At an instinctive level, human individuals and societies must necessarily have evolved patterns of behaviour conducive to the long-term survival of the species. Such patterns are not spelt out as explicit strategic plans, but are enshrined in standing "norms" of behaviour, and thus acquire an apparently static and conservative character. These norms would naturally come to comprise such rules as

"Do not eat the seed corn"
"Maintain adequate defence capability"

as well as complex patterns of behaviour such as crop rotation, social initiation rites, taboos and rituals.

This duality between generally accepted "values", and the characteristics of the environment to which these values are appropriate, is illustrated in Figure 2. At both personal and social levels, an attractive description of this matching of characteristics in a stable society is the sensitive description by Jean Liedloff (1975) of life and child-rearing amongst the Yequana tribe in the Amazon jungle. She generalizes her perceptions as follows:

> "The human continuum can be defined as the sequence of experience which corresponds to the expectations and tendencies of the human species in an environment consistent with that in which those expectations and tendencies were formed. It includes appropriate behaviour in, and treatment by, other people as part of that environment.

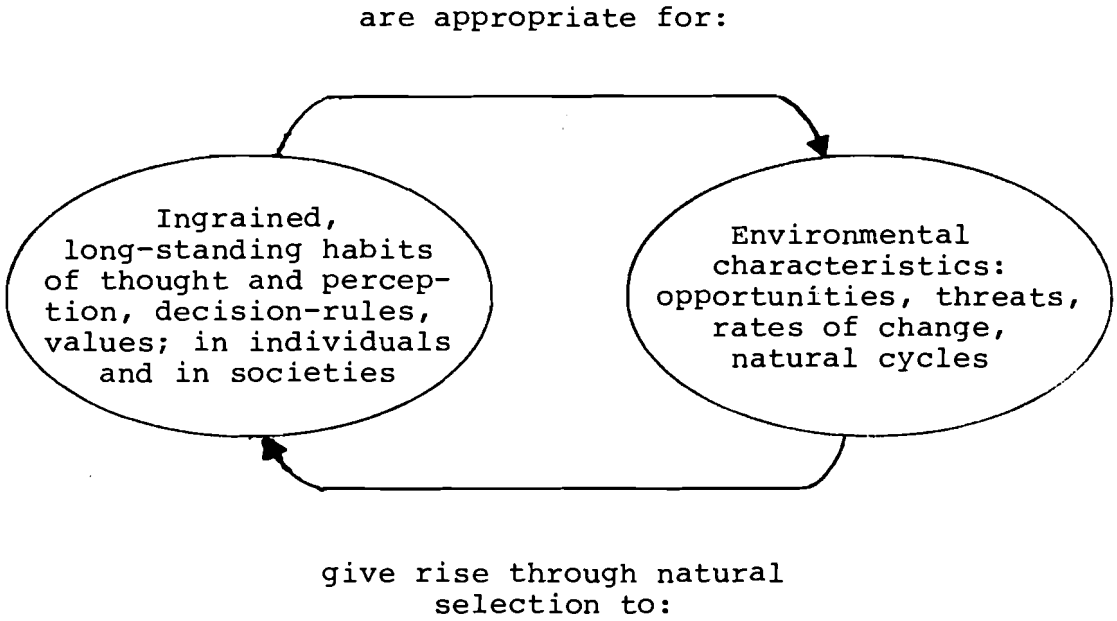


Figure 2: The Match between Values and Environment

> Expectation, in this sense, is founded as deeply in man as his very design. His lungs not only have, but can be said to be, an expectation of air, his eyes are an expectation of light rays of the specific range of wavelengths sent out by what is useful for him to see at the hours appropriate for his species to see them. His ears are an expectation of vibrations caused by the events most likely to concern him, including the voices of other people; and his own voice is an expectation of ears functioning similarly in them. The list can be extended indefinitely: waterproof skin and hair, expectation of rain; hairs in nose, expectation of dust; pigmentation in skin, expectation of sun; perspiratory mechanism, expectation of heat; coagulatory mechanism, expectation of accidents to body surfaces; one sex, expectation of the other; reflex mechanism, expectation of the need for speed of reaction in emergencies."

Figure 2 and the example quoted assume a stable pattern--not totally static, but if the environment is changing, it typically changes at rates and in ways such that the habits of the decision-makers can change sufficiently rapidly to maintain stability: the process is described by Ashby (1960) as "homeostasis", the total system as "ultrastable".

Groups of human beings have always been significant elements of each other's relevant environments. The growth of the population and technological capabilities of human groups has steadily increased the speed and the magnitude of the changes they have induced in their own and others' environments. It has also introduced new kinds of changes. The preservation of our social fabric and living standards therefore requires our methods of decision to adapt to these faster, larger and novel changes.

We can study the processes of adaptation at many levels, from the individual (e.g., Toffler, 1970) to the societal. A particularly rich and thoroughly considered literature exists for the processes as manifest in our economic organizations.

Drucker (1958) has suggested that the corporation as it has developed over the last century or two has been unique amongst human institutions in seeking purposefully to create change (though the impulse towards territorial aggrandisement has similarities). The change in the nature of the corporation--the evolution of its scale and structural complexity in response to the demands of its internal and external environments--have been well-documented by Chandler (1962). Here we are interested more in the concomitant evolution of the values and rules which inform its strategic decision-making. Ansoff (1965) draws extensively on Chandler in his formulation of a "quasi-analytic" approach to strategic planning. In his methodology, which has been widely influential, he structures the time dimension into a "proximate" period, and the "long term". The former is the period within which meaningful quantitative estimates can be made of return on investment (an objective chosen as a

fundamental measure of the efficiency of the resource-conversion process). For the "long term", since return on investment cannot be directly estimated (because of uncertainty), he concentrates instead upon those factors which will contribute to the achievement of strategic strength (and consequently "good" return on investment--whatever numerical level may be viewed as "good" in 20 years' time). It is assumed that the correct identification of these factors is less uncertain than the prediction of quantitative performance. This approach to the setting of long-term strategic objectives is an important one. We refer to it below as "instrumental", since it emphasizes the building of the means to strategic success, the development of appropriate values, rather than the direct pursuit of short-term goals, or the spurious precision of exact long-term targets. This instrumental approach remains close to the standing norms of the primitive community, in establishing current rules and patterns chosen not only for immediate benefit, but for their presumed value to long-term performance and survival. In Ansoff's case, however, these rules are based not on tradition, but on an explicit consideration of the causal relationship between means and ends, in the context of perceptions, forecasts and assumptions concerning the dynamic behaviour of the environment. Effective instrumental development shortens reaction times.

A noticeable feature of strategic planning methodology over the past 30 years has been the expansion of the planning period to longer-term time horizons, and it is interesting to consider the reasons for this in the terms of Figure 1. The scale of organizations, of their component activities, and of the projects lying within human capability, have all increased; and these increases have been generally accompanied by a corresponding increase in the "reaction time" required to bring such projects to fruition. Gold (1978) has documented the strategic and technological success of the Japanese iron and steel industry, and identifies as one of the key contributory factors the persistent willingness to "take the long view"; which he contrasts with the behaviour in the U.S. and Western Europe.

Such changes are predominantly within what we have called the internal dynamics of the organization. The construction of a petrochemical complex, the infrastructure of a new town, or the development of manned space-flight are decisions by unitary agencies to commit in a particular way the resources under their control. They are lengthy projects, and their "appropriateness" as "reactions" to postulated future "events" (to use our earlier terminology) depends upon their relevant environments. Thus the growth of time-scale in projects and associated planning horizons is a reflection also of changes (actual or assumed) in the nature of the environment. Since, for many human institutions, other organizations and their activities are amongst the most significant features of their environments, the fact that organizations have grown in scale and in the scale of their activities itself constitutes relevant environmental change for each organization.

The examples discussed above are of individuals, human groups, and economic organizations. These are instructive, but the lessons learnt are not directly transferable to the

scale of countries and supranational activities. To do that, we need to move to the abstract analysis represented by Figure 1. In the terms of that figure, the relevant events, the appropriate responses and the reaction times have their interpretation at each level, from the individual up to global systems. The problem to which we seek to draw attention is that our familiarity and competence with the largest scale problems, even our willingness to perceive and discuss them, may be developing less rapidly than the need to tackle them. Figure 3 shows some examples.

Changes in the character of strategic environment will require changes in our approaches to strategic planning, especially at large-scale levels, and a critical and continuing attempt must be undertaken, to discriminate between those values and techniques whose worth is invariant, and those which must be modified (or developed where non-existent) to adapt to the demands of the new environment. To the nature of the new environment we return in 2.3 below. The process of strategic adaptation and societal learning will be a slow one; we consider it further in the following section.

2.2 Assumptions, Strategic Models, and the Need for Strategic Control and Societal Learning

R.H. Tawney remarked that the most important characteristics of a man are the things he takes for granted. It is instinctive and fundamental to assume constancy, to seek to maintain it and to restore it if disturbed, to aim at Schon's "stable state" (1971), and to "manage by exception". Yet to cherish one's fundamental assumptions, unquestioned and unchallenged, is to risk drifting unprepared into a situation in which their revision is forced at unpalatable speed. We are prone to cling to the assumptions embodied in our strategic perceptions, our accepted models, long after they have been rendered obsolete by a changing environment.

The process has been documented in many fields. Schon's description of many of the federal agencies of the U.S. as "bureaucracies which are memorials to old problems" (1971) sums up the consequence. The diagnosis has been formulated by specialists in many disciplines, in fundamentally similar terms. Thus Coleman (1978) on U.K. land-use policy:

> "Land-use planning was the only type of planning mentioned in the 1947 Act, and planners were expected to monitor the results of their decisions by producing up-to-date land-use maps every five years. This they have signally failed to do."

Burgess (1977), in an excellent critique of U.K. education policy, points out that

> "In politics and social affairs generally we are all too ready to leap to a solution, and we often persist in the solution, regardless of its irrelevance to our pressing problems."

Level	Example of "Event" requiring anticipation	Appropriate responses	Reaction time	Consequence of failure to react
Individual or family	Redundancy from current employment	Re-training, re-location, etc.	3 to 12 months	Unemployment, abrupt fall in living standard
Corporation	Displacement/obsolescence of current product, process or market, due to social/ technological change	Orderly withdrawal from existing activities with capital recovery, investment in product development and market research, diversification and investment in new areas	2 to 10 years	Loss of sales, profits, decline, loss of jobs, bankruptcy
Country	Continuing loss of market share in world market for manufactured goods	Stimulation of industrial capability and competitiveness; and/or reduction of dependence upon imports	5 to 30 years	Relative or absolute fall in standard of living; social discontent; rising emigration of skill and talent
Western Europe	Exhaustion of local oil supplies, and oil import dependence reaching an unacceptable level	Conserve and economise in consumption of energy; R & D in alternative and and renewable energy sources; maintain and expand coal capability; change life-styles of population	10 to 50 years	Rising oil-import dependence, run-down coal industry, loss of industrial output, unemployment, social unrest, strategic vulnerability.

Figure 3. Multi-level examples of structural dynamics.

Drawing on Popper (1959), Burgess argues

> "The task for the social and natural scientist is one of trial and error; of inventing hypotheses which can be practically tested and of submitting them to these tests. In most current practice the trial is unmonitored, the error explained away."

We have discussed at greater length elsewhere (Cantley, 1978) the nature of strategic monitoring and control, with particular reference to health care, but general relevance to any, public sector planning. We defined

> "monitoring as the process of information-gathering by which the organization checks both its performance relative to targets, and the behaviour of the environment, assumptions about which formed part of the basis for the plan and the targets. Control actions result from the monitoring, and are typically:
>
> (a) to change current actions to ensure closer alignment with plan;
>
> (b) to re-interpret plan targets in light of latest environmental information, and then as (a) above. (Plan targets are often set in relative terms, e.g., "units per thousand population", so that absolute terms, e.g., "units" require an environmental input to fix them).
>
> At a higher level, other results of monitoring may be:
>
> (c) to discover whether an assumption made as a basis for planning (e.g., a postulated relationship) has in fact proved correct; if in fact it is wrong, or a more accurate assumption is now available, an adjustment to plan may be made;
>
> (d) to discover that even the perfect achievement of a planned target is not found to be satisfactory, e.g., because it has not contributed towards the policy objective to which it was supposedly related. The target may then be abandoned, modified or replaced and action as in (a) initiated.
>
> On all levels, the results and possible control actions (a) to (d) above have their interpretations. At the strategic level, the necessary actions are the least likely to be capable of immediate implementation, since by definition they require the widest view of implications and the greatest authority over both resources and policy objectives."

On broad, supra-national strategic issues such as those concerned with European integration, there is no formal strategic monitoring system to promote actions in categories (c) and (d) above. We must therefore depend upon and contribute to the processes of independent public investigation, debate and criticism; which can themselves constitute the monitoring system which should be one of an open society's greatest strengths. One of the greatest menaces to this process of societal learning is the entrenched conservatism--whether deliberate or unconscious--of the professional groups who view the area of debate as their preserve. Krause (1973) has described how comprehensive health care planning in the U.S. has been repeatedly vitiated by these forces: "health planning cannot operate in the present socio-political context except as an ideology to justify the status quo in health services".

In the context of this paper, we shall discuss as our central example a question of strategic economic management. No less in that field do we find the failure or absence of strategic monitoring; as Gunnar Myrdal (1967) expresses it in the prologue to his epic Asian Drama:

> "Economic theorists, more than other social scientists, have long been disposed to arrive at general propositions and then postulate them as valid for every time, place and culture. ... For such confidence in the constructs of economic reasoning, there is no empirical justification. ...we have inherited from classical economics a treasury of theories that are regularly posited with more general claims than they warrant. The very concepts used in their construction aspire to a universal applicability that they do not in fact possess."

Before entering the example, we shall introduce some terms we need to describe the nature of the organizational environments against which our strategic planning and control systems have to pursue adaptation.

2.3 The Causal Texture of Environments

For the general discussion of strategic adaptation, the classification of types of environment by Emery and Trist (1965) is helpful. Drawing on the work of many other authors in a variety of disciplines, they summarize four ideal types of environment. These four serve as theoretical points, probably never found in practice in their pure forms; but they add to our language of description for the various mixed or transitional types of real-world environment we encounter. Moreover, it is possible to consider at the theoretical level the forms of strategic response likely to be more or less appropriate to the different environments.

Type 1, the placid, randomized environment, is the simplest. In this, benefits and dangers are randomly distributed throughout the space in which an entity is pursuing its objectives. It

cannot do better than simply moving towards the benefits and away from the dangers which lie within its current field of perception. Tactics are simple; strategy redundant.

Type 2, the placid, clustered environment, differs from the randomized by the existence of detectable structure in the environmental distribution of benefits and dangers. Consequently the possibility exists for the entity to develop its powers of organization and perception and its structure to take advantage of these environmental characteristics. The result is growth of scale and complexity, and the opportunity for strategic as well as tactical moves.

In the disturbed, reactive environment, Type 3, the placid clustered environment becomes complicated by the existence of other purposeful entities sharing the same environment. Thus the actions of each party have to take account of the interactions with other parties as well as with the environment. Under these conditions, there is further incentive to the growth of scale, and to other dimensions of activity (e.g., R. and D expenditure) whereby advantage may be gained over other participants.

In the turbulent field, Type 4, the behaviour developed to cope with the conditions of the disturbed reactive environment leads to changes in the environment itself--aspects which could previously be taken as fixed (e.g., climate, the natural ecosystem, the legal and institutional environment, fundamentals of social custom and behaviour) start to shift.

As metaphors, models or paradigms for a discussion of economic and political structures and systems in the twentieth century, it is clear that the latter two types of environment are the most relevant. One can trace the parallel concepts in the work of many writers--e.g., Schon (1971) in his description of the loss of the "stable state", for which we as individuals and groups continue instinctively to seek. Ashby (1960) in his discussion of biological adaptation stresses the role of connectedness and constancies in determining the ease or difficulty of adaptation to an environment. "Constancies cut a system to pieces", enabling one to adapt piecewise, one problem at a time; increasing connectedness (the extreme example being like a combination lock) demand simultaneous adaptation to many variables. In international negotiations, bilateral agreements are more easily achieved and kept than multilateral; a sequence of bilateral agreements would be much more difficult to achieve if each subsequent negotiation had to relate to or modify the terms of the earlier agreements. The environmental types introduced above are in order of increasing connectedness, the most complex being the turbulent field.

It is our contention in this paper that the concepts introduced are usable for the practical analysis of large-scale strategic problems. We illustrate this contention by turning in the following section to the contemporary macro-economic problems of the Western European economies, and to some of the rival prescriptions for resolving these problems.

Some aspects of these prescriptions may be compared with the abstract analyses of environment we have introduced, and with the general approaches to coping with such environments which Emery (1967) and others have discussed; we return to these in 3.6 below.

3. THE CASE STUDY: AN OLD SOLUTION, TWO EUROPEAN PROBLEMS AND A NEW SOLUTION

3.1 The Liberal, Integrated, Free Trade Model --

Economic activity and organization are scarcely separable from political organization, least of all at strategic levels and time-scales. Of the decision-rules or values most pervasively established in the economic and political life of Western Europe, few are more profoundly held--in theory--than the collection of economic doctrines known as liberalism, free trade, or the open market system. A consistent and passionate defender of these values has been the U.K. weekly "Economist", whose current promotional publicity proudly informs us that it was "founded in 1843...to promote liberal reform and the repeal of the Corn Laws". The religious intensity with which this faith was held is evident in an article that year (Economist, 1843; quoted by Calleo and Rowland, 1973):

> "Free trade is itself a good, like virtue, holiness and righteousness, to be loved, admired, honoured and steadfastly adopted, for its own sake, though all the rest of the world should love restrictions and prohibitions, which are of themselves evils, like vice and crime, to be hated and abhorred under all circumstances and at all times."

The power and conviction of such language brook no exceptions--the "infant industry" argument is not yet born, and the biblical phrases repudiate the possibility that the Economist might be pleading the case of a sectional interest in a particular country at a specific time, with certain tangible advantages in industrial capability over its trading partners.

An indication of the contemporary success of this doctrine is the preamble to the Treaty of Rome (1957), whose signatories

> "1. Determined to lay the foundations of an ever closer union among the peoples of Europe,
>
> 2. Resolved to ensure the economic and social progress of their countries by common action to eliminate the barriers which divide Europe,
>
> 3. Affirming as the essential objective of their efforts the constant improvement of the living and working conditions of their peoples,
>
> 4. Recognizing that the removal of existing obstacles calls for concerted action in order to guarantee steady expansion, balanced trade and fair competition,
>
> 5. Anxious to strengthen the unity of their economies and to ensure their harmonious development by reducing the differences existing between the various regions and the backwardness of the less favoured regions,

6. Desiring to contribute, by means of a common commercial policy, to the progressive abolition of restrictions on international trade,

7. Intending to confirm the solidarity which binds Europe and the overseas countries and desiring to ensure the development of their prosperity, in accordance with the principles of the Charter of the United Nations,

8. Resolved by thus pooling their resources to strengthen the cause of peace and liberty, and calling upon the other peoples of Europe who share their ideal to join in their efforts,

9. Have decided to create a European Economic Community..."

(Peaslee (1974), numbers added by us for reference). Few would wish to argue with the worthy objectives of phrases 1, 3, 5, 7 and 8. But phrases 2, 4 and 6 reflect the strategic assumption that economic liberalism will be the effective means to the achievement of these objectives. This assumption is similarly central to the philosophy of the OECD, whose founding convention stipulates the promotion of "policies designed

-- to achieve the highest sustainable economic growth and and employment and a rising standard of living in member countries....
-- to contribute to the expansion of world trade on a multilateral, non-discriminatory basis in accordance with international obligations."

The international obligations referred to would include commitments to the International Monetary Fund (dating from Bretton Woods, 1944) and the General Agreement on Tariffs and Trade, whose seven major tariff conferences since 1947 have the declared aim of "progressively dismantling barriers to world trade".

It will be argued in the following sections that the central strategic assumption in the treaty of Rome, the OECD and GATT policies, does not in fact have general validity; and in particular may actually limit the most effective strategies for the pursuit of the professed objectives. Having made this point, we can return to the more general point that we need to develop the habit of making explicit the provisional status of our strategic assumptions, and building the monitoring capability to review them.

3.2 -- and its Shortcomings

The liberal economic system has been a cornerstone of economic theorists from Adam Smith and Ricardo to the present day. Ricardo elucidated the simple algebra of the law of comparative advantage, by which each country should specialize

in those things in which its relative efficiency is greatest, in order to maximize the total welfare; international trade would therefore increase the welfare of each party. His classic example of cloth and wine trade between England and Portugal has been widely quoted. 20th century economists--Hecksher, Ohlin, Stolper and Samuelson elaborated further theorems on the same foundations, showing inter alia that

1. free trading of goods can be a substitute for the movement of labour and capital;

2. trade thus leads to international equalization of wages and interest rates

3. trade must consequently reduce or eliminate inequalities in living standards.

Kaldor (1978) has pointed out the artificial assumptions on which this theory has rested, from Ricardo onwards:

1. The "production function", i.e., technology and the efficiency of its exploitation, the same everywhere;

2. Perfect competition

3. Constant returns to scale (homogeneous and linear production functions).

In agriculture, returns to scale of production eventually diminish as the limits of suitable land and useful inputs are reached; thus in Ricardo's two-product model, although Portugal may specialize in wine, there will be limits to the labour that viticulture can absorb. In industry, it is familiar that over a wide range, there exist increasing returns to scale; thus again in Ricardo's model, the English cloth producers will make it impossible to produce cloth in Portugal; the Portuguese textile trade will be ruined. Nor will it be saved by reducing wages, since there is a minimum wage (in terms of other commodities) below which the cloth workers could not subsist. Friedrich List pointed out that this was the actual outcome of the Methuen Treaty of 1704 between England and Portugal.

Calleo and Rowland (1973) have given an excellent history of the evolution of free trade ideology on both sides of the Atlantic, and we draw freely on their work below.

> "Ricardo's ideas had a rather special application to Britain's politics in the early and middle nineteenth century. The British had gained a formidable lead over other nations in industry and commerce; British manufacturers were more than capable of competing favourably in any open market. British industrialists naturally hoped to extend and consolidate their position as 'the workshop of the world'".

Internally, the rapid and forced transformation of British agriculture caused social distress, and criticism by humanist conservatives. Coleridge, Disraeli and others attacked the disruption of rural society for the sake of cheap food and low industrial wages; but they lost the argument. Externally, the pragmatic Americans remained protected not only by geography and high tariffs, but by an unregenerate nationalist mercantilism. The American economist, Henry Carey, denounced free trade as Britain's policy to perpetuate her supremacy and reduce all agricultural states to permanent tributaries. Gradually, the European states returned to mercantilism, emboldened by the works of the Swabian-American Friedrich List. List argued that while free trade was the natural view of a powerful developed nation, for a nation seeking to develop its industries, it was a short-sighted policy which sacrificed long-range national interests and productive power. He emphasized productive power as "infinitely more important than wealth itself", rather than increased consumption. We may note the similarity to the strategic "instrumentalism" of Ansoff previously discussed.

The successful and protected development of Germany, Japan and the United States in the latter decades of the nineteenth century give clear support to List's analysis; and it is fuzzily accepted even by liberal economists today that the case for protection at least of "infant industries" exists.

Calleo and Rowland sum up how, "when faced with the competitive challenge of the new industrial states, Britain established a vast free-trade empire with the world's non-industrial economies. In other words, Britain responded, not by struggling to retain her industrial superiority, but rather by exploiting to the full her historical advantage in the underdeveloped areas of the world." The results of Britain's failure to maintain and modernize her industrial capability, and her retention of the geographically extended imperial role, were all too sharply identified by both the outbreaks of war, that severest technical audit. Corelli Barnett (1972) has assembled and presented the historical evidence in detail; the lead times shown in Figure 3 may be under- rather than over-stated.

All this history remains of central relevance to the continuing debate about liberalism v. protectionism of various forms. For the debate is not only about the mathematical models of theoretical economics, but also about the nature of the international trading environment, and the validity of some of the assumptions about production capability.

On the nature of the international environment, Keynes, writing in 1933, was clear on the need to revise his strategic fundamentals:

> "I was brought up, like most Englishmen, to respect free trade not only as an economic doctrine which a rational and instructed person could not doubt, but almost as a part of the moral law. ... I thought England's unshakable free trade convictions, maintained for nearly a hundred years, to be both the

> explanation before man and the justification before Heaven of her economic supremacy. ...
>
> It is a long business to shuffle out of the mental habits of the pre-war nineteenth-century world ... But experience is accumulating that remoteness between ownership and operation is an evil in the relations among men, likely or certain in the long run to set up strains and enmities which will bring to nought the financial calculation. ...let goods be homespun whenever it is reasonably and conveniently possible, and, above all, let finance be primarily national. Experience accumulates to prove that most modern processes of mass production can be performed in most countries and climates with almost equal efficiency... We do not wish to be at the mercy of world forces working out, or trying to work out some uniform equilibrium according to the ideal principles, if they can be called such, of laissez-faire capitalism. ...the policy of an increased national self-sufficiency is to be considered, not as an ideal in itself, but as directed to the creation of an environment in which other ideals can be safely and conveniently pursued. ...we have until recently conceived it a moral duty to ruin the tillers of the soil and to destroy the age-long human traditions attendant on husbandry, if we could get a loaf of bread thereby a tenth of a penny cheaper."

Echoes of Disraeli!

In the environment of the 1970s and 1980s, the fundamental issues remain unaltered. Meadows (1979) has pointed out how the U.S. energy-import pattern of long-distance tanker routes understates the true cost of oil--since the costs of maintaining adequate security of supply are borne by the Department of Defence. In his work on wood-fired electricity generating plant in Vermont, he has pointed out the failure of conventional economic criteria to take account of the full within-state benefits of local production.

The standard international free trade model, as List pointed out, makes many strong assumptions, including international and domestic peace as a given condition of its analysis. In the real world, national security obviously could not be taken for granted. List argued that, for reasons of security, states should not be overly dependent on other states, and should therefore strive for a balanced and relatively self-sufficient economy. Domestically, List also saw economic activity as a great "collaboration" of labour within a smoothly functioning social system. Essential to this collaboration was the existence of a peaceful, protected community, which contained not only the necessary skills, but also the capacity to put them to work.

Notwithstanding the circumstances of his time, List foresaw a stage in European development when free trade would become beneficial; but according to Calleo, List's view was that "a plural system can remain open only insofar as it does not unduly threaten the cohesion and self-determination of the national units".

Calleo and Rowland's model of interstate political systems is readable either as a contribution to general system theory, or as a good descriptive fit to history. We start from some of their definitions:

> "By a system we mean a group of closely interrelated or interdependent states. We characterize as imperial an international political system with one dominant power and with the other states in some considerable degree of dependence and constraint...
>
> ...a plural interstate system is composed of closely related powers, sufficiently equal in resources and pretensions so that none is able or perhaps even willing to exercise overlordship over the others. Such a system normally organizes its relations around conceptions of a balance of power and rules of the game--models and precepts designed to moderate competition and prevent hegemony...
>
> Federalism introduces several variations in these interstate models and their governing ideologies. A federal system seeks the unifying order and certainty of an imperial system, but without the hegemonic domination by a single state. Unity is sustained either by placing over the constituent states a supranational "federal" authority, designed to represent the federation as a whole rather than any of its units in particular, or else by establishing a confederal arrangement among the constituent states, designed to engage them in an organized procedure for making and carrying out certain decisions collectively. The United States after 1789 gives an example of the first kind of attempted federal system; the Common Market today gives an example of the second...
>
> These patterns of political relations have their economic equivalents...an international political order that is plural has a tendency toward economic protectionism among its parts. Nations wishing to maintain national political self-determination also wish to avoid economic dependency."

Calleo (op. cit. and 1974a, b) points out that modern industrial states are mercantilist rather than liberal domestically, in the acceptance by government of active responsibility for shaping and managing the economy, promoting growth and maintaining employment.

> "A liberal economic system among nations nowadays can no longer base itself on free trade and convertibility alone, but demands as well considerable sustained and organized cooperation among governments... Hence the Common Market, a customs union which sustains a liberal plural economic relationship among domestically mercantilist states, has required increasingly elaborate intergovernmental machinery, including a separate bureaucracy with independent powers."

To operational researchers, the liberal economist's model is familiar in the guise of the convicts' dilemma, translated into the terms of Figure 4. On this model, GATT negotiations, Common Markets and similar activities represent an attempt to build the trust and cooperation to bring all parties into the top left-hand corner, and prevent defections into the adjacent boxes. Each partner is tempted to defect from the agreement, but is inhibited by the general fear of the bottom right. It is a crude, simple model, whose validity depends on assumptions increasingly questionable; in particular it ignores the dynamic aspects of scale economies in the growth of industrial capability at all stages. Some examples of these are discussed below.

Reference has been made to the "infant industry" argument. This is essentially about dynamics, which is why Ricardo's model fails to include it; for his production function ignores returns to scale. Returns to scale are often thought of in static terms, but the evidence of the "learning curve" and consequently of "dominant market share", which are well substantiated by empirical evidence in a variety of industries, lead to a dynamically increasing advantage of scale determined by cumulative production. In its simplest form, it leads naturally to monopoly, since nobody could ever catch up with the efficiency of the first producer: van der Rijst's (1978) diagram (reproduced as Figure 5) is a good example. In practice,

		Country A	
		Liberalize trade	Protect
Country B	Liberalize trade	Satisfactory for both	Better for A, worse for B
	Protect	Better for B, worse for A	Worst case for both

Figure 4. "Convicts' Dilemma" Model of International Trade Protection/Liberalization Issue

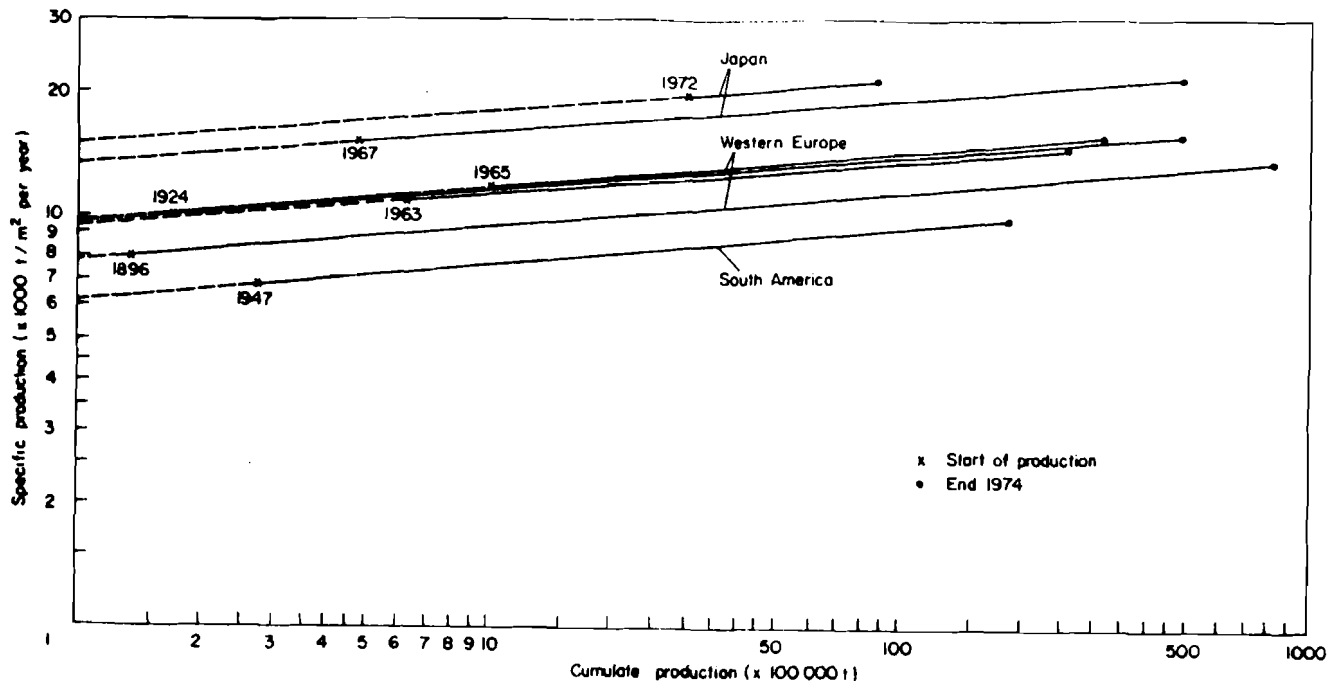


Figure 5. Blast furnace productivity (tons per square metre of available hearth area per year) in plants of various countries and vintages: the effect of cumulative dynamic scale.

Source: van der Rijst, 1978

natural barriers of transport cost, and other advantages of proximity to customers, possibly supplemented by deliberate protection, make the pure global monopoly case unlikely; and for developing countries, even the liberal economists accept the case for some protection to build up domestic industry. Moreover, few countries which have struggled to build up a domestic manufacturing capability will tolerate its subsequent elimination by foreign competition, even once its infancy is over. Vietorisz (1974) gives a good illustration of this in his description of the Mexican electric motor industry, in a paper which also has much to say about the inadequacies of "comparative advantage" in allowing for the dynamic and structural aspects of industrial development:

> "...technology transfer...appears as a means of perpetuating dependency, or contrariwise, breaking out of it. ... Something crucial is evidently left out of the comparative advantage model--namely, the analysis of the development of the institutional structure supporting industrialization and technological progress, which has a sequential character, reflected in the sequence of introduction of electric motors of progressively larger size and progressively greater technical complexity."

Vietorisz also quotes the nineteenth century U.S. and Japanese experience; then returning to his theme of third-world development problems, on which he was working for the U.N., comments

> "The enormous weight of economic tradition supporting the comparative advantage principle makes it difficult to define effective criteria... Advice given under the traditional point of view is likely to transfer technology in such a way as to perpetuate dependency rather than help break out of it. Yet the protagonists of these views have the most impeccable academic credentials from some of the world's leading institutions of higher education."

What the liberal economists fail sufficiently to allow for is the changed structure of the world environment since their theories were developed. Hobsbawm (1968) brought this difference out in his history of Britain's industrial revolution:

> "...problems which are acute in modern underdeveloped countries setting about their industrialization were mild in eighteenth-century Britain. ...transport and communications were comparatively easy and cheap, since no part of Britain is further than seventy miles from the sea, and even less from some navigable waterway. The technological problems of the early Industrial Revolution were fairly simple. They required no class of men with specialized scientific qualifications, but merely a sufficiency of men with ordinary literacy, familiarity with simple mechanical devices and the working of metals, practical experience and initiative. The centuries since 1500 had certainly provided such a supply. Most of the new technical inventions and productive establishments could be started economically on a small scale, and expanded piecemeal by successive addition. That is to say, they required little initial investment, and their expansion could be financed out of accumulated profits. Industrial development was within the capacities of a multiplicity of small entrepreneurs and skilled traditional artisans. No twentieth-century country setting about industrialization has, or can have, anything like these advantages."

However, the "infant industry" case of initial industrial development is by no means the only case to which dynamic economies of scale are relevant. Kaldor (1978) has usefully clarified this in the paper already referred to, where he points out the unrealistic assumptions of the classic international trade theory.

> "The present division of the world between rich and poor countries is a relatively recent phenomenon: it is due to the fact that the countries which successfully industrialized accumulated a great deal of material and human capital in the course of industrialization. All <u>developed</u> countries are invariably successful producers and exporters of manufactured goods. The phenomenon of 'polarisation'

happens within as well as between countries--the classic example is that of the North and South of Italy which following unification has shown a strongly divergent development--unification served to enrich the North and to impoverish the South.

Thus international or interregional trade is capable of enlarging differences in living standards between areas, as well as diminishing them. Both forces operate, the important question is which of these two tendencies is likely to predominate?

We can distinguish between three types of trade:-

(1) trade between manufacturing countries and primary producers;

(2) trade between manufacturing countries with each other;

(3) trade between primary producers with each other.

It is only in the case of the third type of trade that the classical theory of mutual advantage strictly applies. Depending on climate etc. it pays some countries to concentrate on producing wheat or potatoes and others on oranges and bananas. As regards the first type of trade--whether it is the exchange of wine against cloth or raw cotton against cotton shirts--the benefits from trade are likely to be disproportionately large for those countries which import raw materials and export manufactures.

The interesting case is trade of the second type--trade between manufacturing countries which has greatly intensified since World War II, thus reversing the trend of the previous fifty years which was towards more 'autarky' as between the leading powers.

In principle such trade is of great practical benefit since specialization between the industries of different areas should enable the benefits of the economies of scale to be realized more fully. However the truth of this proposition depends on the trade being balanced in both directions--a state of affairs in which the exports of manufactures of each country increase pari passu with its imports of manufactures. But as past experience, both pre-war and post-war, has shown, this does not come about naturally. Growing imbalances of trade may arise which are not easily corrected. After the second World War the successful countries like Germany and Japan acquired a cumulative advantage through their fast growth, whereas the slow-growing countries such as Britain (and to some extent also the United States of America) faced an increasing handicap due to their slow growth. On account of

> the dynamic effects of fast growth it is possible that a particular country's products become qualitatively superior, and hence preferred to those of another country, in all branches of industry. It can be argued that Japan's growth (and to some extent also Germany's growth) in the post World War II period was enhanced at the expense of the two trade-losing countries, the U.S. and the U.K. These latter countries suffered from increasing import penetration in their domestic markets of manufactures which was not offset by higher exports, which meant in effect that their national output was reduced in consequence. (The labour released from manufacturing industry either remained unemployed or found employment in trades where its social marginal productivity is very low)."

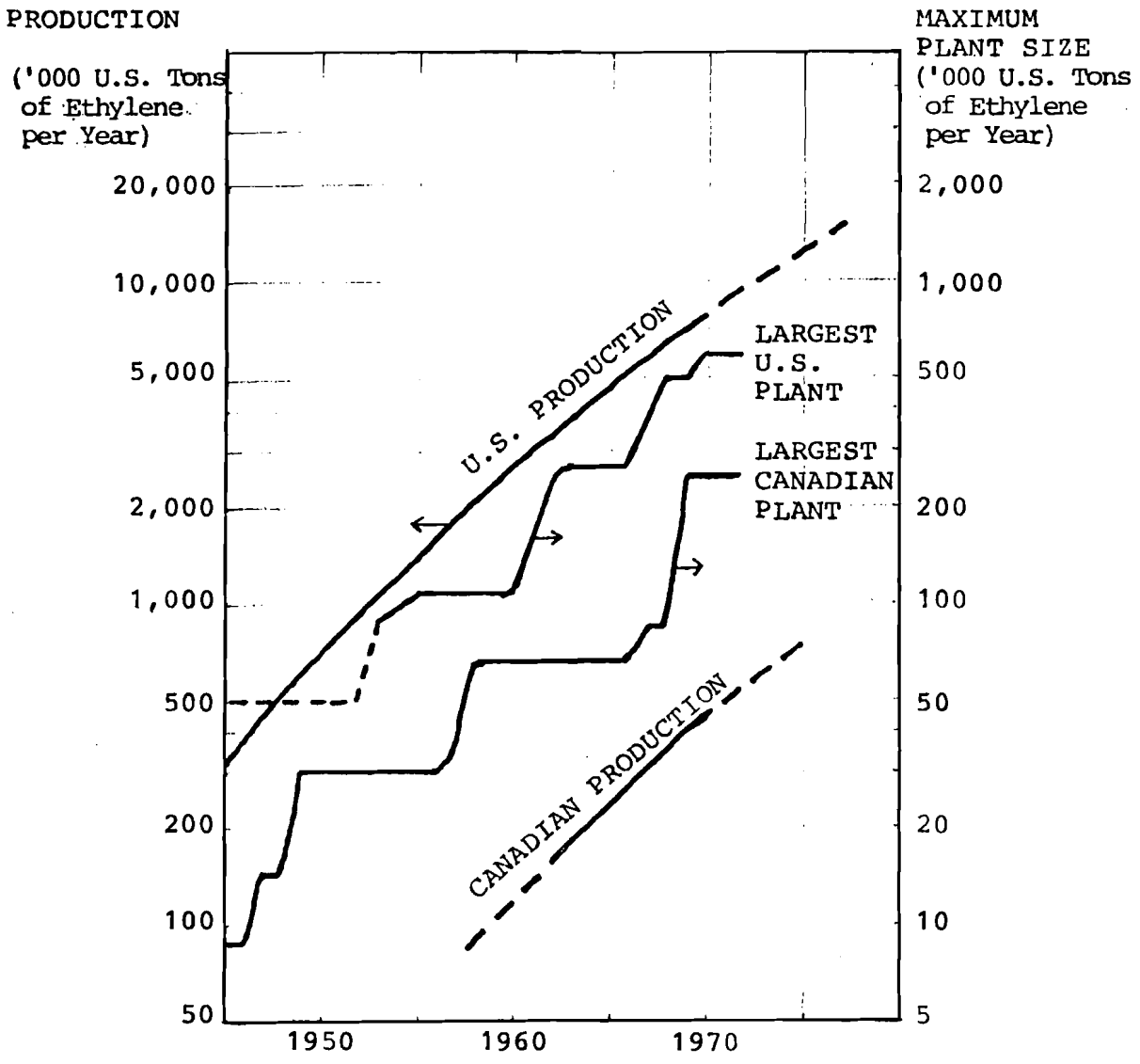
The polarization and scale phenomenon has been documented by Simmonds (1969) in the context of the Canadian-U.S. situation of the respective chemical industries: Figure 6 summarizes his data for ethylene. If Canada wishes to maintain a chemical industry in such sectors, and to build up the related high value-added, high wage and high skill employment, then some tariff protection will continue to be necessary until Canada's total production reaches a scale where the most efficient size of plants can be employed.

These questions of scale are an important example of the divergence between the theoretical model of Ricardo and the Economist, and the political and technical realities of the world. There are however more specifically pressing contemporary strategic problems in European macro-economic management, to which we turn below. The materials already introduced reappear as part of broader issues.

3.3 A Cluster of Contemporary Strategic Problems

We opened this paper by a discussion of the role of O.R. in strategy. Similar issues were addressed by John Stringer (1976) in an important paper on the role of O.R. in public policy, itself echoing earlier expressions of concern (1962) by the Tavistock Institute and and O.R. Society, about O.R.'s slowness in penetrating the broad social and economic sphere. One of Stringer's contentions was that historically, O.R. had been

> "...a significant social invention... The ability to offer new options was as significant as the ability to provide a rationale for choice between options that were already known. Unfortunately, a) quantitative analysis and b) being close to a powerful decision-maker, are the characteristics of those early days which have continued to be valued in O.R. circles. In that the analogy between 'operational commander' and 'public policy-maker' is a false one, it seems to me that these are not the values which should have



Source: Simmonds (1969)

Figure 6. Growth in Scale of Ethylene Production and Maximum Plant Size, U.S. and Canada

> been carried across as dominant. A more fruitful analogy would have emphasized c) the creative synthesis aspects and d) service to the true analogue of 'commander'--i.e., not a single powerful individual, but a process involving many actors."

We follow Stringer in selecting

> "A cluster of issues...salient problem areas which, if looked at together, might generate options that would be unlikely to arise from regarding them as separate problems."

Within the class of problems which our historical experience has encouraged us to view as soluble, or at least capable of mitigation, by action in the public domain, two are of central relevance to Western Europe in the coming decades:

1. The maintenance of employment

2. The achievement of geographically balanced development.

We shall link the discussion of these specific problems with the other issues already introduced--the applicability of the liberal free trade model, questions of scale, the development of national strategy in a tightly connected environment--and with the values underlying the politics of European integration.

The problems exist on several levels, both broader and narrower than the European environment, being familiar in both national and global terms. However, if we start in the middle, we may shed light on the adjacent levels, and the European one is the obvious starting point in our current conference. We select the two issues out of the wider field of economic management in general because these two are seen as particularly linked with questions of European integration, unlike other (economically related) issues such as the control of inflation, or broader issues such as the validity of economic growth as a social objective.

3.4 The Employment Problem

Within the framework and timespan chosen for this paper, population is taken as exogenously determined, as are the various age-sex-specific levels of desired participation in employment in each country. Our basic economic model is as follows:

$$\text{Gross output} \equiv \text{Output per head} \times \text{Number of Workers}$$

$$\text{Number of Workers} \equiv \text{Population desiring to work} - \text{involuntarily unemployed.}$$

So far, these are identities, which will hold good in every time period and country. In considering the evolution of

economic activity over the next few decades, we have fairly accurate population forecasts. If productivity growth is taken as exogenous, then one is left with a direct connection between the rate of growth of output and the level of unemployment. Productivity growth is of course variable, but for the OECD countries the rate of growth of output per man-hour in manufacturing industries has ranged from just under 3 to 5% p.a. over recent decades (see examples in Figure 7). The McCracken report (1977), which studied carefully the problem of the return to full employment, concluded that recent trends in labour productivity did not suggest any substantial deceleration. With population growth of around 1/2% p.a. typical of developed industrial societies at present, this indicates 3 1/2% p.a. as the minimum rate of growth to maintain constant unemployment; to reduce it from the levels it has already reached, which are historically very high by post-war standards, will require significantly higher rates for the next few years.

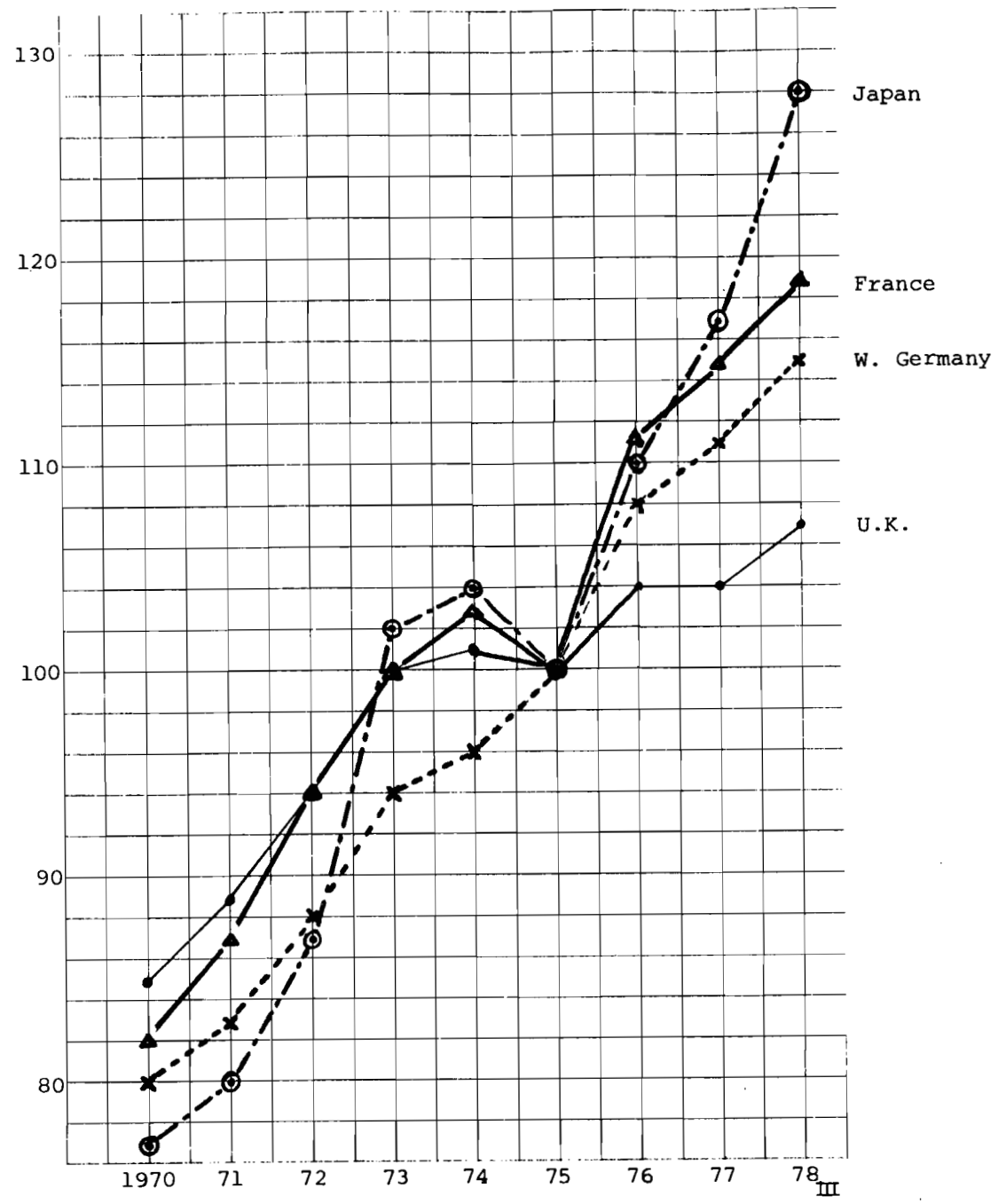
It is well-known that institutional factors in existing economic structures, reinforced by "employment protection" legislation, cause this high unemployment to be concentrated amongst young people, married women and "early retirers", i.e., the sectors least organized industrially. For the same reason, mobility in the labour force is inhibited. While reduced mobility and low growth may be conducive to some aspects of social stability--and the U.K.'s declining suicide rate contrasts with the rises in the faster-growing eocnomies of Europe (Sainsbury and Jenkins, 1979)--the concentration of unemployment among the young will lead to long-term alienation and social problems.

There was therefore general agreement, when the OECD met at Ministerial level in June 1978,

> "...that given the disappointing economic record of recent years and the costs and dangers inherent in the continuation of present trends, more sustained economic growth was needed. It was recognized that, to create the conditions for this, internationally concerted action had to include many elements: energy policies, open international trading policies, and domestic policies designed to facilitate rather than resist adaptation to structural change, as well as appropriate domestic demand management and stabilization policies." (OECD, 1978)

The OECD report recognizes the obvious--that in the current and prospective situation, the expansion of output is not supply-constrained--and therefore advocates the standard Keynesian prescription of "moderate national injections of purchasing power". However, having offered the traditional remedy, the report even-handedly continues by explaining why what is suggested cannot in fact be implemented:

> "...for a single stimulating country, much of the stimulus typically leaks out into imports... A



Source: National Institute Economic Review, 1979, p.79

Figure 7. Index of Output per Man-Hour in Manufacturing, 1975 = 100

> country which acts alone to raise demand and output therefore needs a relatively large domestic stimulus to achieve a given demand and employment effect--and this is accompanied by a fairly substantial deterioration in its current external balance. This phenomenon has long been experienced in the smaller OECD economies with proportionately large foreign trade sectors. But with the rising share of international trade, upon which much of the general growth in prosperity over the last twenty years or more has been based, it appears that there may now be no economy which can indulge in a wholly 'go-it-alone' policy, ...it is clear that...it would be inappropriate for all countries today to play an equiproportionate part in a general expansion.... Where an overriding constraint is the current balance position, countries should avoid taking unilateral stimulatory action."

Thus the picture of the convicts' dilemma returns, in the modified version of Figure 8. As McCracken (1977) puts it, "if ever there was an example that...economics is not a zero-sum game, this is it." It is difficult to overcome the trust and co-ordination problems between two parties in this game; how much more so when it depends upon near-unanimity amongst half a dozen or more significant national economies, each of whose major decision-makers is simultaneously seeking to adapt to the needs of his internal environment of elections, wage claims and parliamentary business!

		Country A	
		Stimulate Demand	Restrict Demand
Country B	Stimulate Demand	General, "balanced" expansion	Good for A's exports, bad for B's balance of payments.
	Restrict Demand	Good for B's exports, bad for A's balance of payments.	General low growth

Figure 8. "Convicts' Dilemma" Model of International Demand Expansion/Restriction Issue.

3.5 Balanced Development/Polarization

The advantages of concentrating one's forces for maximum effectiveness have been known from the earliest military strategists to the latest theorists of conventional warfare--Lanchester's laws give the concepts mathematical precision. Industrial economies of scale have become similarly familiar over the past two centuries. These have been described by many authors, in industrial economics, plant engineering and other disciplines relevant to industrial management (see particularly Scherer (1970), Scherer et al. (1975), Gold (1975, 1978) and Cantley and Glagolev (1978, 1979)).

Industrial economies of scale may be identified at several levels:

1. The unit of equipment
2. The total plant or factory
3. The (multi-plant) organization.

The scale economies achievable on these three levels are sometimes referred to as internal, being largely within the control of the organization. Of no less significance are the external economies of scale, which concern the relationship between the organization and its environment. Thus its financial power (for bargaining with suppliers, customers, or long-term finance) increases with scale. But an important factor, perhaps the most important enabling factor, is at the level of the relevant environment, which although somewhat different in nature, should be added as the fourth item on the above list. The relevant environment is often seen in market terms, and as Simmonds (1969) has pointed out, the scale of national market is an important constraint on some capital intensive industries characterized by economies of scale. But there are more intangible advantages, dynamic as well as static, in the existence of large-scale industrial organization in a given geographical area. The climate of expectation is altered; the availability of a suitably educated workforce; the social infrastructure; all contribute to a positive feedback system which polarizes industrial development round a limited number of centres.

Historically, natural factors such as mineral resources or deep water harbours may have given rise to industrial development. But eventually the accumulation of industry and society, with the resulting market potential and the industrial and social infrastructure, becomes itself a continuing attraction. Given the historic dispersion of population, transport costs to distribute goods determine the point where further economies of scale are outweighed by increasing transport cost. However, for a growing range of goods, the increasing value added per unit of weight diminishes the significance of transport in the final cost. Consequently the effective radius of the centralized production is increased, to the detriment of smaller scale producers who were previously defended by their isolation. Where the field of attraction is gravitational, astronomers have described the results of such implosion processes as "black holes", from which escape is impossible.

The economic analyst can readily demonstrate the gain in aggregate social welfare on conventional criteria. Less easily demonstrated are the diseconomies produced in congestion and in diminished quality of life in the urban areas, in the slums, the suburbs and the satellite towns. Because the centre exists, it is "not economic" to provide in these satellites facilities which would be taken for granted in isolated towns of similar population.

The loss of vitality in the periphery, in the remoter provincial areas, the metropolitan drift of the economically active age-groups, and the gradually rising average age of those who remain--these can be documented all round the outer half of Europe, from Yugoslavia through Greece, Southern Italy, Spain and Portugal, large areas of France, Ireland, Northern England and Scotland. In "Tess of the d'Urbervilles", the novelist Thomas Hardy, writing of rural Wessex in the 1880s (when it was suffering the consequences of Britain's free trade, cheap food policies) refers to the economists who note "the natural tendency of rural people to move the towns" and comments that this tendency is "as natural as that of water to flow uphill when driven by machinery".

Within national economies, there is in Western European democracies a virtually complete freedom of movement of people, goods and capital; and no national government has yet found effective means to control the process of regional polarization which has resulted. It is a problem related to the employment problem by the fact that in times of recession, the economic problems and the level of unemployment are typically greater in the depressed regions. The development of nationally determined uniform wages and working conditions has also removed one of the few instruments by which the peripheral regions might have effected a partial defence of their economies.

If the national economies of Europe are to subordinate their autonomy and ability to control their destinies within a more uniform European set of rules, then clearly the welfare gains to be won from such a surrender must be both sufficient in total magnitude and sufficiently evenly distributed in their effects to command and to justify the necessary political support. There is neither historic empirical evidence nor reasoned argument at the current time to give one confidence in any such hypothesis, and there was little of either in President Jenkins' call for "a new economic impulse on an historic scale... by a faster move towards economic and monetary union" (Jenkins, 1978).

A careful article on this theme in the specific context of European monetary union and the U.K. by the N.I.E.S.R. (1979) states:

> "The creation of a single common market and monetary union may well reproduce the 'regional problem' only now at the national level. Within the new community some members may find their entire economy suffering

> various 'regional' disabilities, for example abnormally high unemployment, but they no longer dispose of the exchange rate instrument to assist recovery."

Some of the possibilities of maladaptive strategies have now been introduced in the specific context of specific problems. In looking for new and better strategies, we pick up the strands of our theoretical development again.

3.6 Adaptation to Turbulent Field Conditions, Values, and Corresponding Political Structures

In a paper which follows and develops that in which Emery and Trist (1965) introduced the environmental types referred to in 2.3 above, Emery (1967) discusses how individuals and organizations adapt to the different types of environment. In Type 3, the disturbed reactive environment, whose salient characteristic is the presence and reactions of other participants, Emery comments:

> "There seems little doubt that even the formulation of strategic objectives is influenced by this kind of environment. It is much less appropriate to define the objective in terms of location in some relatively static and persisting environment. It is much more necessary to define the objective in terms of developing the capacity of power needed to be able to move more or less at will." (our emphasis)

There are close similarities between this analysis and the conclusions of Friedrich List, already quoted, on the response to the imperial system. Ansoff's "instrumentalism", concentration on the capabilities contributing to strategic strength, offers a similar conclusion in the context of competitive corporate strategy.

However, Emery goes on to describe the trends--often the results of attempts to meet Type 3 "disturbed reactive" conditions--which have produced Type 4 "turbulent fields".

> "What is significant of our present era is the emergence of a degree of social organizational complexity and a rate of coalescence of previously segregated populations that defy our current efforts at symbolic reductionism.
>
> If our analysis is correct, then the next thirty years (at least) will evolve around men's attempts to create social forms and ways of life that are adaptive to turbulent environments or which downgrade them to the less complex types of environments."

Of the forms of response which Emery then discusses, not all are appropriate to the context of national planning. He mentions

> "...fragmentation...the possibility of parts pursuing their ends without respect to the total system.... As a response to over-complexity this is adaptive, provided and insofar as there emerge other system relations which, while less binding, enable the enhanced self-control of the part to be guided by a knowledge of the state, capacities and goals of the total system. Such system relations are emerging in national planning etc."

Although Emery does not make the point, the potential relevance of this to the European Communities seems clear.

More actively, Emery suggests that the emergence of values of over-riding significance for all members of a field is a common human response to persisting areas of relevant uncertainty. No European could dispute the central role which value systems have played as the driving forces of our history--a glance through the chapter headings of Joll's magnificent sweep, "Europe since 1870", shows over half the chapter headings to be about values. An impressive paper which demonstrates the linkage from the details of industrial competence to the collective experience of a nation, is Gold's description (1978) of computerization in the Japanese steel industry: shared national values and a sense of commitment, along with the readiness to take the long-term view, he identifies as crucial. We refer elsewhere to Barnett's analysis of British values, similarly central to an understanding of strategic behaviour and policy. Values remain no less important in the European context as we seek to regain control of our economic system. The questions of choice of values, and of the means by which they impinge upon individuals and organizational structures, is seen by Emery as soluble by a single strategy. This is

> "...based on the notion that it is in the design of their social organization that men can make the biggest impact upon those environmental forces that mould their values. ...further, the strategy assumes that if these changes are made in the leading part, the socio-technical organizations, the effects will be more likely to spread more quickly than if made elsewhere...
>
> ...the choice is really between whether a population seeks to enhance its chances of survival by strengthening and elaborating special social mechanisms of control or by increasing the adaptiveness of its individual members; the latter is a feasible strategy in a turbulent environment and one to which western societies seem culturally biassed."

Notwithstanding Emery's opinion, it seems to us that the two macro-economic problems we have discussed, structural unemployment and geographical polarization, demand a response at the level of social mechanism. Individual adaptation sounds like emigration of the talented. There is in Western Europe a long-standing and clearly evidenced desire, a "value" in Emery's terms, for individuals to control their own political destiny. This sense of control may be illusory; at the individual level, it almost always appears so; but societal arrangements and institutions should seek to enhance rather than diminish the citizen's control of his environment. In democratic societies the subordination of the individual to the majority will of the community is a social contract fundamentally based on the consent of the individual. The contract can be greatly strengthened if there exists widespread consensus of opinion within the society. Such consensus can be rapidly eroded, however, at both national and European level, by the persistence of the problems we have discussed. Those of us who favour the concept of a united, European Community must aim to achieve a structure whose capability to solve strategic problems will merit our subordinating ourselves to its necessary constraints. This might be termed a "strategic functionalist" view, in line with the established concept of functionalism described below.

To the general question of how far the individual should be expected to accept the constraints of communal action, the answers established by historic usage are multi-tiered: we recognize the need for different levels of scale for different functions. In our local communities we accept social controls and a common system of street-lighting, refuse collection etc.; I cannot opt to have my house frontage left in darkness. To the nation-state many of the wider powers have been subordinated, so that the bulk of taxation to raise public revenue and the control of its expenditure are channelled through central government. The government may in turn subordinate its freedom in supra-national alliances and treaties, such as NATO or the Treaty of Rome. "The national framework is clearly 'too big now for some purposes that need smaller units; too small for other functions that need a supranational scale'" (Buchan (1969), quoting Kitzinger (1968)).

Buchan wrote ten years ago, in the context of an extended essay on Europe's futures, that

> "some coherent structure is required that will still enable Europe to keep in sight the goal of economic and political unity, while remaining sufficiently open-ended to match and adapt itself to the possible shifts in the balance of power, and the cross-currents of the economic and financial forces... The use of a variety of approaches will be the key to success. Such a Europe might be found in a strengthened form of functional cooperation; modelled on the community method, but neither seeking to embrace the totality of political responsibilities in the field of foreign policy and defence, nor looking to a federal superstate as its ultimate objective... Common institutions

> can only be developed concurrently with common interests; they cannot create them.
>
> ...such a functional system would be flexible and open. It could absorb changes in membership and extend itself into new fields, without a publicized confrontation with high national policies and without offending the pride of national sovereignty."

Buchan credits the Rumanian, Mitrany (1965) with the exposition of this "functionalism", and Mitrany's writings have been widely influential; Spinelli (1957) points out that Mitrany probably developed his original concepts (in 1943) by transference from the multi-national military commands of World War II. Hodges (1972) and Taylor (1968) also draw extensively on Mitrany. The conditions of war call forth (or demand) an extreme consent to constraint for common interest. In arguing for some constraint on trade propensities, we would similarly justify it by reference to the pressure of urgent need.

The functionalist model is supported by the work of Dahl and Tufte (1974), who set out to determine "the optimum size for a political system". They recognized that different problems called for units of different sizes, and that the fundamental goals of citizen effectiveness and system capacity were in conflict. They looked at the "theoretical solution...a system having an indefinite number of units without permanently fixed boundaries, a system capable therefore of ready and infinite adaptability", but dismissed this as too expensive and unsettling. Their compromise conclusion is "not an optimal unit but an optional number of units with comparatively fixed boundaries".

A basically functionalist view is similarly the conclusion of Leopold Kohr (1976), a lively and controversial writer whom one never knows quite how seriously to take:

> "[what] is needed is not the introduction of social controls but the reduction of social size to proportions within which fluctuations can do no harm because the market area through which they can transmit themselves is simply not large enough to permit dangerous amplifications."

Kohr argues strongly for an optimum size of society, around 200,000. This is extendable by modern technological, educational and organizational tools to a maximum of 12 to 15 millions, beyond which the performance of its functions deteriorates; but he does not rule out supra-national association for specific purposes. The unique charm and the doubtful reasoning are captured in his panegyrical analysis of the budget of Liechtenstein (population 17,000), which he receives each year from the principality:

> "From the absence of funds set aside for an Un-Liechtensteinian Activities Committee one sees that problems of subversion, anxiety, and hysteria, so common in larger powers, are non-existent; and that, as a result, the mood of the country is placid and serene."

3.7 The Inadequacy of the Free Trade Model; Regulated Trade

From what has been said, it will be clear that we are suggesting that the current responses of the national governments of Europe, and the strategic models or concepts on which those responses are based, are inappropriate to current conditions. The strategic model of free trade liberalism is unfortunately rather explicitly built into the Treaty of Rome, as has been noted. In fact, the strategy built into the treaty is failing to meet the objectives, also written into the treaty. Fortunately the pragmatic heads of Europe have repeatedly demonstrated their ability to concentrate on practical essentials, and when necessary, place their collective telescope to their respective blind eyes.

The European Community has in practice been much less than dedicated in its pursuit of the principles of economic liberalism. The treaty itself recognized the sensitive political and social facts of European agriculture, although a rational resolution of its problems is still debated. The common external tariff explicitly protects European industry, but its reduction--*pari passu* with parallel reductions by Japan, U.S.A. and other trading partners--is under negotiation at the GATT conference. The d'Avignon plans for industries plagued by excess capacity--in particular steel--do not follow the free market logic of "weakest to the wall"; but seek to cut capacity while maintaining historic market shares. Such characteristics of Commission-approved re-structuring plans say much about political realities in Europe, and about the flexibility of the Commission in interpreting the principles of the treaty. But they do not meet the problem described in 3.4 above--which would stress not so much "excess capacity" (which could occasionally occur in specific industries) as the general current "deficiency in demand". As Edmond Maire, the French trade union leader, expressed it (1979):

> "Barre and Schmidt claim there has to be more investment to create jobs. In fact, this investment is largely in manpower saving. If we agreed to accept their brand of austerity, the industrialists will make more profits and we won't get more jobs. We will have higher productivity--but still no jobs. Jobs will come only from an industrial and social policy conceived on an all-Europe scale...firmly protectionist against the outside world."

The reasons why demand cannot be stimulated have already been outlined in 3.4. The examples quoted indicate the various messy compromises which are made with the historic principles; but they are neither solving the contemporary problems fully, nor illuminating the search for new strategic principles.

A statement on these lines has just been published by a group of 16 economists from Italy, France and Britain, whose conclusions are as follows (Formica et al., 1979):

> "Existing policies in the Community, including EMS, fail to solve the problem of unemployment because they do not deal with the constraint imposed by world recession; they do not distribute growth between member countries in accordance with need; and they do not permit or support measures to develop production in regions of under-employment and low productivity.
>
> There is a wide range of alternative policies. The Community must find ways of examining them and putting at least some into effect. Otherwise many of its member countries and regions may never achieve the employment and prosperity which was the Community's original aim.
>
> The time has come for members of the Community to recognize that new forms of organization are needed to deal with the world economic crises and with the problem of national and regional inequality."

The strategy built into the treaty is failing to meet the objectives, and there is no explicit strategic monitoring and control system whereby the failure of the old model can be officially recognized. "Official" opinion fulminates against protectionism as heresy, as in the GATT Secretariat's annual report:

> "Without a basic change in the present trend of international trade policy--that is, without a clear return to more liberal trade practices, accompanied by the necessary adjustment measures--the stage would appear to be set for a further cumulation of economic difficulties...increasing protectionism generates economic uncertainty..." (GATT, 1978)

Nowzard (1978) of the IMF gives the same message, albeit with an opposite opinion on protectionism's short-term effects:

> "...such restraints may perhaps introduce an element of certainty in trade relations over the short term. Even so, the organization of markets does not appear to be conducive to the dynamic evolution of trade according to the principles of comparative advantage, efficiency and nondiscrimination..."

Such authors think they are fighting to keep countries in the top left-hand cell of Figure 4; but the open market environment is in fact holding many countries in the bottom right-hand box of Figure 8.

The IMF's economic orthodoxy is legend, and has been strongly criticized, e.g., by Cheryl Peyer (1974), for its uncritical use of comparative advantage, leading for example to the encouragement in the third world of monoculture cash crops, which are vulnerable to commodity price fluctuations and perpetuate dependency. Reynolds (1978) like Kaldor has suggested

that the third-world countries would be better advised to break this pattern and trade liberally with one another, while protecting their infant industries against the developed world. But the pragmatists in governments are largely unsupported by the economic orthodoxy in academic and international institutions. Thus suggestions for new models have to be unofficially initiated and developed, and ritually condemned as heresy, before they are seriously considered as a basis for revising official policy.

Godley (1978) and his colleagues (Godley and Cripps, 1978) have followed through the logic of the situation so clearly identified by the OECD (as quoted in 3.4 above), and although their work has been framed in a U.K. context, it is clearly of wider application.

They propose that the U.K. should escape from the bottom right-hand box of the convicts' dilemma in Figure 8, by controlling the total level of U.K. imports. The words "import control" immediately indicate the heresy, the apostasy from the ideals of liberalism and the violation of the treaty of Rome; and have attracted a correspondingly hostile reaction (The Economist, 1978; Godley, 1978). This is understandable in terms of these frameworks, but not particularly logical, since the U.K. in common with many other countries already controls its imports, indirectly, by depressing the total level of domestic demand below the productive potential of the economy. In other words, by deflation and unemployment.

Cripps (1978) has pointed out that releasing "balance-of-payments-constrained" countries from their constraint need not reduce world trade. It is only by enabling the constrained countries to regulate their trade propensities that they can expand domestic output to its full employment potential. At this higher level of output, their import needs will be not less than in the case of deflated restriction of output; and

> "indeed if the composition of its imports is shifted against 'surplus' countries and the latter do not retaliate, the total volume of world trade will rise, enabling the rest of the world to expand production; 'surplus' countries will regain elsewhere trade which they have lost in the country which discriminates against them and therefore will have no valid reason for retaliations."

To translate the new strategic model which Godley proposes into the European environment would give new meaning to the OECD concept of "concerted reflation". It would incorporate some sort of agreement on "organized trade" on the lines being hinted at by the French prime minister, M. Barre, whom Kaldor (1978) quotes as follows:

> "...there should be new 'rules of the game' (which should be collectively defined and applied) which assure conditions of growth, security and regularity of trade without which 'free trade is nothing more

> than a pretext for the strongest and least scrupulous as well as being a trap for the weakest'".

Amongst academic economists, the "new Cambridge" school (Godley et al) have been slow to win converts (though Beckerman, 1979, has given his clear-cut assent). The tone of side-line commentators, the financial journalists, has moved from condemnatory to equivocal. But the politicians are naturally more responsive than the academics to the growing need for some changes to be made in the unsatisfactory real world. As Jenkins (1978) says in his presidential address to the European Commission,

> "...we must not take refuge behind a theoretical concept of the market economy in order to sidestep the responsibilities which the crisis of industry imposes on the governments and on the Community."

Perceiving such defections from the paths of righteousness, Cohen (1978) stridently warns against the emergence of "a new strain of protectionism",

> "The delicate tension between the relatively long-range logic of expanding world trade based on an international specialization of labour and the immediacy of official concern for the health of the domestic economy has become tilted in favour of the latter."

And yet in the same paper, Cohen observes that certain dynamic, non-Western societies

> "appear to operate beyond the pale of traditional Western trade theory. ... Japan's trade surplus in manufactured goods of some $63 billion in 1977 cannot be fully explained by the principle of comparative advantage."

Clearly, as operational researchers know, if human behaviour isn't fitting the theoretical model, their behaviour must be wrong; consequently Cohen berates the Japanese for their "generally impenetrable distribution system...their notorious practice of subtle administrative guidance to pressure importers..." Cohen, of course, from an American background, has some justification for criticizing the industry-specific protection which union pressure has maintained in sectors such as the U.S. textile industry. As Godley (1978) points out, a general control of the <u>total</u> import level may be combined with a complete absence of long-term <u>industry-specific</u> protection, allowing market disciplines to stimulate internal efficiency; indeed Godley is particularly critical of "creeping protectionism".

The general lines of the solution proposed, in its restoration of control of aggregate inward trade flows to individual nation states, is precisely in line with the suggestion by Emery (see 3.6 above) of down-grading the turbulent field

environment to a less complex one, by "fragmentation" as outlined in the preceding section. It returns a vital degree of control to the national level, thus increasing the capacity of the state to meet effectively the needs of its constituent citizens. This, after all, is what nation states are for, as noted by the political theorists quoted above. Moreover, it is precisely written into the Treaty of Rome ("Affirming as the essential objective of their efforts the constant improvement of the living and working conditions of their peoples"). An important but fundamentally technical recommendation--and this paper is about technical questions--should not be seen as necessarily inimical to those wider interests--including the benefits of mutual balanced trade--which European integration can promote. As President Roy Jenkins (1979) put it in his obituary for the great Jean Monnet, "flexibility of method, and constancy of goal".

4. CONCLUSION

In conclusion, let us briefly re-capitulate. We have suggested that the conduct of long-term strategy in general, and specifically the conduct of macro-economic policy at national and supra-national level, are not subjects which need or should be reserved for the technical discussions of specialized economists. That strategic issues such as these can usefully be subjects of study by operational researchers and others; and that there appear to be strong grounds for questioning the strategic appropriateness of one of the basic models of the conventional wisdom.

The issues we have discussed are of central importance to the formulation of economic and industrial strategy, at both national level and in the European Commission. We have disagreed with some of the articles of the Treaty of Rome, but only because we have argued that they are not appropriate means by which to pursue the essential objectives of the Treaty: objectives to which we gladly subscribe. But progress towards the social and political goals of a strong and united Europe will not be advanced by methods which are destructive of the industrial capability and social fabric in large areas of our continent. The drive towards these objectives will be more effectively sustained if based on shared democratic and social values, than if represented as the technocratic progress towards implementing the naive algebraic models of the 1840s.

As efforts at would-be-scientific analysis and prescription, we are conscious that "Strategic O.R." studies lack the greater rigour of "Tactical O.R.". How strategic studies should be conducted is not yet clear; but some tools have been offered. The availability of long-period relevant data, and the validation of a clear-cut model based on this data, cannot be expected to approach the standards of statistical rigour achievable in more localized investigations. Therefore one must be more than usually conscious of the "provisional" status of one's model. However, because of the time-spans involved in the detection of error, the "provisional" period is long, and fundamental learning

is bound to be slow. This does not in principle change the methodology; but since human memories are short, there may be advantages in spelling out our strategic models, and making explicit forecasts based on them, as grist for the mill of strategic monitoring and control. In such ways we can contribute to the ongoing processes of public and institutional learning, adaptation and increased strategic effectiveness.

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