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# TOWARDS AN APPROPRIATE SOCIAL THEORY FOR APPLIED SYSTEMS THINKING: CRITICAL THEORY AND SOFT SYSTEMS METHODOLOGY

J. C. Mingers

**INTRODUCTION** Systems Theory, in its applied aspects, has been increasingly adopted to guide interventions within the sphere of human action and yet, as Bryer and Kistruck [1] have shown, has consistently assumed that human beings are little different from the components of other types of system. I believe this to be fundamentally mistaken and argue that any attempt to take action within this sphere must be grounded within an explicit social theory which does not deny the uniquely complex nature of the world with which it attempts to deal.

Two recent contributions to this debate have discussed the connections between Checkland's soft systems methodology and theoretical social science. Prévost [2] argued that it should be situated within the Functionalist tradition while Naughton [3] argued that Prévost 'failed to establish his claim' that the methodology was functionalist. In this paper I shall not enter that debate directly, although by implication it should be clear that I do not believe the methodology (or at least the intention behind it) to be functionalist; rather I seek to demonstrate similarities with the sociological tradition known as Critical Theory and in particular the work of Jürgen Habermas.

Critical Theory refers to the work of the neo-Marxist writers of the Institute for Social Research founded at Frankfurt such as Adorno, Horkheimer and Marcuse [4]. More recently Habermas has produced a critique of science and technology which includes an attack on systems theory and particularly systems analysis. It might therefore appear, at first sight, that the two should be dedicatedly opposed and yet, although there are important disagreements, the striking similarities make it seem possible that the two approaches may both benefit from a dialogue [5].

## Habermas - Critique of Science and Technology

**INTRODUCTION** Habermas is concerned to analyse the effects on society of the rise of what he describes as positivist science since the nineteenth century as part of a critique of Western Society and to go on to develop a theory of 'communicative competence' as a means of emancipation from the repressive distortions introduced by society. His starting point in this analysis is a conceptual division of human behaviour into two types characterised by work (purposive-rational action) and interaction (communicative action). This dichotomy is similar in spirit to previous sociological categorisations such as Gemeinschaft/Gesellschaft (Tönnies), informal/formal groups (Mayo, Homans) and traditional/bureaucratic authority (Weber).

Purposive-rational action is rational choice or instrumental action and is governed by technical rules which determine the choice of means to realise predetermined goals or values. It is acquired through learning skills and enables us to solve problems. It is based on empirical propositions and is tested by success or failure in the world.

Communicative action, on the other hand, is concerned with symbolic interaction between people. It is governed by consensual norms and expectations expressed in intersubjective language and acquired through the internalisation of role expectations. Its function is the specification and maintenance of socially valid norms and institutions. This distinction allows Habermas to classify the various societal components in terms of which type of action predominates - for example purposive-rational in economic and state subsystems and communicative in family and kinship subsystems ([6] p. 91-4).

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## THE RISE OF POSITIVISM

In historical terms we can see that traditional, pre-capitalist societies were predominantly communicative and gained their legitimation from mythical or religious interpretations of reality. Purposive-rational subsystems existed within these societies based on the system of social labour and craft knowledge but never challenged the institutional framework. However, the advent of capitalism created an economic subsystem that attempted to guarantee self-sustaining economic growth and therefore:

... the *permanent* expansion of subsystems of purposive-rational action ... overturns the traditionalist 'superiority' of the institutional framework to the forces of production ([6] p. 96).

This led to the need for new legitimations compatible with the rationale of the economic system and it is these which Habermas sees positivist science as supplying. Science, in its development from the nineteenth century, became for the first time intimately linked with technology and production, firstly by providing knowledge which, by its very form (i.e. deductive-nomological) is technically exploitable [7] and secondly through the institutionalisation of scientific research. The scientific model of purposive-rational action has now become dominant in society, a result which, for Habermas, has had serious consequences.

In the eighteenth century science and reason were aligned with the idea of liberation and emancipation from the constraints of ignorance and dogma. Reason and rationality were committed against dogmatism to actively helping answer what Habermas calls 'practical' and 'emancipatory' questions, the former concerning the discussion and creation of norms and values in the sphere of communicative action and the latter concerning the liberation of individuals from personally and societally distorted patterns of communication and ideology [8]. However, the rise of positivism has led to a situation in which rationality can only answer our 'technical' questions by way of control and manipulation. Practical problems are either suppressed or transformed into questions with purely technical answers. How has this come about?

## POSITIVISM'S CLAIM TO RATIONALITY

Positivism (taken to be the belief that knowledge is characterised in terms of general laws, empirical testing, prediction and control, and value neutrality), in its stand against dogmatism, claimed for itself the role as the only form of valid knowledge – the only *rational* knowledge. Rationality and reason came to be identified with scientific knowledge and understanding. The fact that only questions capable of being cast in this empiricist-analytic form could be tackled and the explicit rejection of value-judgements in the interests of objectivity meant that it limited itself to technical questions; practical questions became detached from scientific thinking. Moreover since science had claimed rationality and reason for its own, practical questions were beyond rationality itself and any attempts to deal with these questions were automatically branded as dogmatic since, *by definition*, they could not be rational.

This has led to a situation in which science is supposedly totally independent of all values, and questions concerning norms, values and objectives cannot be answered rationally but are to be merely *decided* in some arbitrary manner, at which point science can step in and specify the best (i.e. most efficient) way of achieving the desired goals. Theory is totally divorced from praxis except in a technical sense. Reason can no longer be committed to a cause or point of view.

... action still demands an orientation, as it did before. But now it is dissected into a rational implementation of techniques and strategies and an irrational choice of so-called value systems. The price paid for economy in the selection of means is a decisionism set wholly free in the selection of the highest-level goals. ([9] p. 265).

However, Habermas shows that the idea that science and rationality is totally value-free cannot be sustained. The choice to combat dogmatism with rationality must, itself, either be justified rationally, in which case rationality is committed, or be itself dogmatic and acknowledge that rationality is a value.

## THE IDEOLOGY OF SCIENCE

Beyond this, however, science has led to the creation of a particular value system, one in which 'behaving in accordance with technical recommendations is not only desirable but also "rational"'. [9 (p. 269)]. This is because science provides *efficient* means of reaching

particular ends – this indeed is the *only* criterion within technology – and therefore efficiency has come to be valued in itself. Yet it is not seen as being a value in itself since it is identified with rationality. To act rationally is to act efficiently. This is the model which Habermas sees society applying to itself and this

... concept of rationality ... ultimately implies an entire organisation of society: one in which a technology become autonomous dictates a value system – namely, its own – to the domains of praxis it has usurped – and all in the name of value freedom. (19) p. 270).

Eventually, Habermas foresees, this process, led by systems analysis, will reduce all other value-systems to a decision-making framework

organised in order to meet the basic value of survival in a given situation and to avoid risks. The goal functions ... here disappear in favour of formalised goal variables, such as stability or adaptability, which are bound solely to a quasibiological basic requirement of the system, that of reproducing life. (19) p. 273).

To summarise the argument so far, Habermas believes that practical questions concerning norms and values have become divorced from any possible rational approach and that

agreement on a collective value system can never be achieved by means of enlightened political discussion ... by way of a consensus rationally arrived at, but only by summation or compromise-values are in principle beyond discussion. (19) p. 271).

Moreover, purposive-rational action, embodied in the systems analysis movement, will eventually lead to the dominance of its own implicit values – efficiency and survival.

#### HABERMAS'S RESPONSE

What does Habermas feel can be done about this situation? We can see the direction of his answer in the previous quotation but firstly it is important to note that he does not advocate a return to traditional communicative societies whose

logic accords with the grammar of systematically distorted communication and with the fateful causality of dissociated symbols and suppressed motives. (16) p. 96).

What he does want to achieve is the possibility of a *rational* consensus through adequate and appropriate communication. At the moment we can truly understand neither ourselves nor others because of systematic distortions introduced at a societal level by the prevailing (scientific) ideology and power relations and at a personal level by psychological repressions and neuroses. We cannot therefore communicate freely and honestly with ourselves or each other [10]. To overcome this we need firstly theories whose aim is the enlightenment of individuals to their situation, theories which expose the distortions in our understanding at a personal and social level such as psychoanalysis and critical social theory.

As well as this however, we need to ensure that the debates within which a rational consensus is to be discovered is itself free from any distortions or barriers to communication. Habermas needs, as well as a theory of distorted communication, a theory of communicative competence [11]. He believes that the *possibility* of consensus is implicit in the very nature of language based as it is on consensual, intersubjective expectations although for the reasons set out above it is not currently realised. We need therefore some way to judge whether some particular agreement is a true or false consensus and Habermas tries to supply this with his idea of the 'ideal speech situation', or pure intersubjectivity.

... pure intersubjectivity exists only when there is complete symmetry in the distribution of assertion and dispute, revelation and concealment, prescription and conformity, among the partners of communication. ([11] p. 371).

This general description leads to more specific particular requirements involving firstly the specification of a sound or cogent argument which will motivate us to accept its correctness and secondly a description of the conditions within which such a debate should take place. This has two requirements – firstly completely equal participation in terms of information, balance of power and opportunities within the discussion and secondly, following from this, unlimited scope for radicalisation of the discussion – that is for questioning at a deeper and deeper level right up to the framework of the debate itself [12].

## Checkland – 'Soft' Systems Methodology

**INTRODUCTION** I shall now turn to Checkland's work drawing mainly on an unpublished document [13] which provides a condensed summary of his ideas. His primary concern is the proposition that the development of systems ideas and thinking can help us both in understanding the world and in trying to resolve its problems. To this end he and his colleagues have developed a methodology to guide the handling of 'soft' problem situations.

Historically, systems ideas developed from Biology and Engineering and in their application to 'hard' problems (with clearly defined goals in essentially a design role) have proved reasonably successful. However, their wholesale transfer to 'soft' problem areas (unstructured situations with no clearly defined or even articulated objectives) has been notably less successful.

**THE HUMAN ACTIVITY SYSTEM** Checkland's starting point is the concept of a human activity system (H.A.S.). Real-world manifestations of the concept (the concept itself being an ideal type) will entail a group of people combining together to perform some purposeful activity. Evidently, such a system can, at least notionally, be organised in differing ways. Real manifestations of the concept thus provide the context within which real world problem-solving must take place. Such real-world systems are however extremely complex because they are what in everyday language we call 'social systems'; they involve our 'natural' behaviour as human beings. To clarify this, Checkland makes use of a distinction between activity and behaviour which is very close to that of Habermas and is based on the *Gemeinschaft/Gesellschaft* distinction of Tönnies. Behaviour consists of the natural, social interactions within a *Gemeinschaft* setting and as such is not capable of being designed or changed, while activity has a purposeful, intentional character within a *Gesellschaft* setting which is, in principle, capable of change. H.A.S. as manifest necessarily involve both and any attempt to work in such systems must take account of this and therefore be based on some form of explicit social theory.

**OBJECTIVES AND WELTANSCHAUUNGEN** Human activity systems manifest in the real world consist of human beings who are purposeful and it is within such systems that objectives and measures of performance can be originated. It is these which allow the possibility of meaningful change since without them there is no possibility of a better or worse states of affairs. The elucidation of the objectives of actors within such a system therefore becomes of primary importance for the task of problem-solving but this is by no means as straightforward as might be thought (for example, within Management Science/OR circles). This is because of the behavioural side of the dual nature of real-world H.A.S. Natural systems may be given different descriptions by different observers but at least remain consistent in themselves; but with H.A.S.

... not only will what is observed depend on the observer's purpose but also the components of the system, being purposeful human beings, will have a range of perceptions both of the system as a whole and their role within it. ([13] p. 5).

These differing and often contradictory perceptions will all be valid in respect of the particular actors *Weltanschauung* (W) or 'world-view', a concept which is very important in Checkland's work.

This concept encapsulates the notion that our experiences of the world are mediated or interpreted in terms of our purposes, knowledge, values, expectations etc, which have developed in particular ways through our previous experiences and that although we may have much in common with each other we have significantly different and yet equally valid ways of experiencing the world. Checkland uses Vickers's concept of an 'appreciative system' [14] to make this idea more explicit. An individual's appreciative system consists of an organised set of 'readinesses' –

'readinesses to notice particular aspects of our situation, to discriminate them in particular ways, and to measure them against particular standards of comparison which have been built up in similar ways [15].

The importance of an actor's *Weltanschauung* is that it is only in relation to some particular W that an objective or goal can become meaningful. Conversely, understanding the underlying W behind many objectives and actions can be very revealing. If objectives stem from W's (although these generally remain implicit) and if, within a particular real-world H.A.S., there are multiple and conflicting W's it is clear that the establishment of agreed objectives and thence measures of performance, the first stage in attempted problem-solving, is extremely difficult and yet of vital importance for the success of the intervention. This, Checkland argues, is the primary reason for the failure of systems analysis as it has been applied in the past: too easy an acceptance of conventionally defined objectives such as profit maximisation or economic efficiency. Despite their objections, it is clear from an examination of the literature [16] that in the classic systems analysis/OR methodology, determining objectives is seen as straightforward and, moreover, they are almost always specified in purely economic terms. This is not surprising when we consider that systems analysis developed from systems *engineering* and that engineering is basically a design activity – that is, a problem of creating the 'best' (usually most efficient) means to realise some well-defined goal.

#### CHECKLAND'S METHODOLOGY

Systems analysis has failed in its attempt to deal with soft, unstructured problem situations where values and objectives are multiple and conflicting. What is necessary therefore is a methodology which explicitly faces this problem and attempts to expose and counterpose the various W's in order to reach some valid consensus concerning possible changes based on an appreciation, by the actors involved, of their own and others' values and beliefs.

Based on a program of action research within real-world situations Checkland has developed such a methodology. I shall outline this only briefly as it has been well documented elsewhere [17].

- (1) Consider and recognise the analyst's role in the situation and the *Weltanschauung* that makes the study meaningful.
- (2) Proceed to an initial analysis of the problem-content system attempting to remain as open and free from preconceptions as possible.  
On the basis of this analysis, name a number of possible H.A.S. and their corresponding W's which may be 'relevant' to the problem.
- (3) For each of these produce a 'root definition' which should be a concise and yet comprehensive description of the system and the viewpoint it expresses.  
For example, the 'problem' of creating Concorde could be seen as:
  - a design and engineering task system
  - an Anglo-French collaboration system
  - an environment threatening system
  - a 'keep ahead of the Americans' system
- (4) Create a conceptual model for each of these root definitions in terms of the activities necessary for a H.A.S. to be the system so described.
- (5) Compare these models (which are not to be seen as what should be but purely as models of concepts) with each other and with the initial description of what actually exists.
- (6) Use these comparisons to structure a debate between concerned actors within the situation in order to achieve some consensus on agreed changes or at least clarify and redefine the situation.

Thus the outcome of this process may be either the specification of desirable and feasible changes, a redefinition of the situation or a lack of agreement possibly because of an inappropriate choice of systems at stage 2. However all of these can now serve as fresh input to the methodology which is iterative.

Problem-solving in human activity systems is seen to be an on-going process rather than an engineering process in which some end defined as desirable is achieved. (113] p. 6)

No 'solutions' in human activity systems are permanent; 'problem-solving' is another name for living. (113] p. 8)

Philosophically, Checkland sees the methodology as compatible with Churchman's analysis of 'inquiring systems' [18]. The comparison stage (5) seeks the Lockean consensus of concerned actors; the formulation of competing W's operationalises the Kantian/Hegelian dialectic; and the *Weltanschauung* of the methodology itself (learning is desirable but can never be complete) makes it as a whole Singerian.

#### **Underlying Similarities between Critical Social Theory and Soft Systems methodology**

Having outlined their respective arguments, I shall now make more explicit what I see as the three main points of agreement between them.

#### **THE BEHAVIOUR/ACTIVITY DICHOTOMY**

It seems clear that both are trying to elucidate essentially the same classification of human action – purposeful activity or purposive/rational action as opposed to social behaviour or communicative interaction – although Habermas's analysis seems to be more thorough, based as it is on a number of dimensions such as type and level of definition, acquisition and function. Moreover, it serves as a pivotal point throughout Habermas's writing. At the cognitive level it permits the distinction between the technical interest in control and prediction and the practical interest in intersubjective communication [19]; at the methodological level between the empirical-analytical sciences and the hermeneutic-dialectical sciences (and also critical theory aimed at removing distortions in understanding and communication) [20]; and at the sociological level between purposive-rational subsystems and their communicative institutional framework [6].

The essence of Checkland's categorisation is between that which is 'natural', because of the nature of the human animal, and therefore in a sense unchangeable, as opposed to that which is chosen and therefore changeable. It is, however, far from clear precisely where this distinction might lie (witness the longstanding nature/nurture debate). The social world is surely just as much a human construction as the purposeful world and Critical Theory in general seems aimed precisely at this point in trying to reveal the way in which the nature of society affects the nature of its members.

Checkland has to draw a clear distinction between natural systems and human activity systems and then finds a problem in locating social systems which he solves by saying that they have the characteristics of both [21]. I feel that it is better to draw a distinction between systems or contexts of social action and contexts of purposeful action and then claim that human activity systems embody both types. However, what is important is his recognition that both will be present in any real activity system whereas Habermas remains at a level of analysis in which the two largely remain separate.

#### **THE FAILURE OF SYSTEMS ANALYSIS**

Nevertheless both writers come to the same conclusion that systems analysis, in its approach to real-world problem-solving, is essentially mistaken and both agree on the reason for this. Systems analysis remains tied to the sphere of technical rationality from which it derived – the domain of the control and manipulation of non-human objects and processes based on the rules of economic and analytic rationality. Systems analysis fails to recognise the distinctive character of its subjects – purposeful, self-defining, reflexive human beings and the context within which the creation and agreement of objectives and values takes place. Instead of addressing itself to this problem, systems analysis has, so far, merely assumed the values implicit in its own domain of technology and engineering, those of efficiency and technical control.

#### **RESPONSES TO THE PROBLEM**

At this point we reach the most important agreement between them, in that their response is to deny the claim that rationality must remain divorced from the domain of values, and both are attempting in different ways to achieve precisely this bringing together. Both aim to unite theory and praxis and develop a rational approach to the realm of communicative interaction in order to bring about change in the world and help people solve *their own* problems. Positivist social science is also used to bring about change and 'rationalise' the development of society but does so in an oppressive and manipulative fashion by denying

the claim to values other than its own. Critical Theory stands against this and aligns itself with the people it studies – it studies for them. It concerns itself with helping actors solve their problems, firstly by communicating directly to them in an attempt to

enlighten the social actors so that, coming to see themselves and their social situation in a new way, they themselves can decide to alter the conditions which they find oppressive. (17] p. 103)

It educates but doesn't impose. Secondly, this process is not purely one-way but relies crucially on

a critical interchange between the policy expert and the actors who will be affected by his decision. (17] p. 106)

Thirdly, and going beyond this, the validity of critical social theory rests with the actors themselves – do they finally judge it to be useful?

That the methodology embodies similar aims can clearly be seen. It attempts to increase the awareness of actors in a problem situation both by spelling out the consequences of a particular *Weltanschauung* and by contrasting and demonstrating the validity of other, competing *Weltanschauungen*. The role of the analyst is not one of imposition but elucidation; the goal of the methodology is not manipulation but consensual debates and its criteria of success depend on its usefulness to the actors and not its validity for the analyst. The methodology takes seriously the hermeneutic view that the social world is different in kind from the natural world; that it is a domain of human construction *constituted by* the meanings and practices of its members. Social theory must therefore proceed by gaining an 'understanding' of actions *within* the social framework which supplies them with meaning.

... understanding is not merely a method for making sense of what others do ... *it is the very ontological condition of human life in society as such.*

(123] p. 19, original emphasis)

#### Disagreements

POLITICAL The first, and most obvious, difference is that Habermas goes beyond hermeneutic analysis of practical questions to provide a theory of the distorting and repressive effects of society on the communicative domain. Habermas is a political radical and Critical Theory, as the name implies, is concerned to provide a critique of society for the emancipatory benefit of its members, while Checkland's primary concern is problem-solving *within* society without the *a priori* value of political change. In this respect, Critical Theory seems to involve a contradiction in that it emphasises the primacy of the views of actors and yet is premised on its own particular value, that of emancipation.

The main criticisms that Habermas levels at systems analysis are that it is manipulative and that it maintains and reinforces the political status quo. The first of these charges, as I have demonstrated above, cannot be levelled at Checkland's methodology but the second seems to have more force. If you believe that problems within society are not merely contingent but systematically created by the very structure of society then small scale problem-solving, 'piece-meal social engineering', cannot help but maintain that which is the very problem – society itself. It should be noted, however, that Habermas himself does not advocate revolution but a position that he calls radical reformism–

An attempt to use the institutions of present day capitalism in order to challenge and to test the basic or kernel institutions of this system.

(124] p. 53)

On the other hand, the pressing problems still besetting the world such as hunger, disease, poverty and pollution demand that action and intervention occur now, and strategies for such problem-solving are obviously vital. Physical emancipation still seems a necessary prerequisite for mental emancipation.



The soft methodology, based on a view of the nature of social reality – that we each develop differing and conflicting ways of perceiving, experiencing, valuing and expressing the social world – sets out to expose and contrast these various *Weltanschauungen* in order to try to reach consensus. However, if Habermas is right, any consensus thus reached will be false in the sense that, at the moment, our perceptions and understandings are based on systematic distortions created both by society and our own psychological development (although the extent to which these can be separated seems problematic). It seems ultimately 'decisionistic', in Habermas's sense of the word, in that, in stressing the differences between W's, it takes them at face value rather than noticing the similarities and seeking an explanation for this in terms of the structure of society. Thus, to point out that Lord Robens has a very different conception of the coal industry than a miner [22], while true, ignores the fact most people in Roben's position will have a similar appreciation which will be very different from that of miners who in general have suffered very different experiences. It therefore lacks an explanation of why these particular W's have developed and thereby how they might be changed. It lacks a critical social theory.

Moreover, it lacks a theory at the psychological level – a recognition of the difficulties of changing peoples' ways of thinking. Merely to outline possible *Weltanschauungen* is not enough – people display a considerable resistance to change. Their construct systems tend to be self-stabilising and self-validating in the sense that phenomena are interpreted in particular ways, based on a person's *Weltanschauung*, and once construed in that way they then serve as a confirming instance validating the initial premises. For a discussion of the problem of resistance to change in relation to Critical Theory see [25].

In its practical applications, the methodology has generally been used in a way which is conservative, legitimating and preserving the W of a particular group of people – those in positions of power and authority – although I do not think this is inherent in the methodology but stems from the context within which these studies have been carried out – that is, financed by various public and private sector institutions. To avoid this, it needs to take more account of the problems of attaining distortion-free communications such as those created by unequal power relations and unequal opportunities to present, discuss and question differing viewpoints.

### Conclusion

I have tried to show that there are important parallels between these two apparently conflicting strands of thought. Habermas and Checkland both identify essentially similar problems in attempting to relate theory to praxis and both are trying, in different ways, to respond to these by bringing an *appropriate* concept of rationality to bear on the domain of norms and values. Neither have yet been successful, but I believe they will benefit from a mutual dialogue.

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### References

- [1] Bryer, R. and Kistruck, R., 'Systems Theory and Social Science: The Problems of Applying Systems Concepts to Social Organisations', *Working Paper 29*, S.I.B.S., Warwick University, 1976.
- [2] Prévost, P., '“Soft” Systems Methodology, Functionalism and the Social Sciences', *Journal of Applied Systems Analysis*, 5, 1, 1976.
- [3] Naughton, J. 'Functionalism and Systems Research: A Comment', *Journal of Applied Systems Analysis*, 6, 1979.
- [4] See for example Connerton, P. (Ed.), *Critical Sociology*, Penguin, 1976; Adorno, T. and Horkheimer, M. *Aspects of Sociology*, Heinemann, 1973; Adorno, T. and Horkheimer, M., *Dialectic of Enlightenment*, Allen Lane, 1973; Marcuse, H., *One-Dimensional Man*, RKP 1964; Marcuse, H., *Negations*, Allen Lane, 1968.
- [5] As appears to be the case in a debate between Habermas and Luhmann, a German systems-theorist. Habermas, J. and Luhmann, N., *Theorie de Gesellschaft oder Sozialtechnologie*, Frankfurt, 1971, (unfortunately untranslated); Sixel, F., 'The Problem of Sense: Habermas v Luhmann' in O'Neill, J. (Ed.), *On Critical Theory*, Heinemann, 1976.
- [6] Habermas, J., *Towards a Rational Society*, Heinemann, 1971.

- | 7| For a clear discussion of this argument see  
Fay, B., *Social Theory and Political Practice*, George Allen and Unwin, pp. 31-47, 1975.
- | 8| Habermas, J., *Knowledge and Human Interests*, Heinemann 1972.
- | 9| Habermas, J., *Theory and Practice*, Beacon Press, Boston, 1973.
- | 10| Habermas, J., 'On Systematically Distorted Communication', *Inquiry*, 13, 1970.
- | 11| Habermas, J., 'Towards a Theory of Communicative Competence', *Inquiry*, 13, 1970.
- | 12| McCarthy, T., 'A Theory of Communicative Competence' in Connerton, *op. cit.* (4).
- | 13| Checkland, P., 'Notes on the Argument of the Core Course: "Systems Thinking and Practice"', Lancaster University, 1975.
- | 14| Developed in  
Vickers, G., *The Art of Judgement*, Chapman and Hall, 1965; Vickers, G., *Freedom in a Rocking Boat*, Pelican, 1972.
- | 15| Vickers, G., *op. cit.* (1972) p.102.
- | 16| Checkland, P., 'The Origins and Nature of Hard Systems Thinking', *Journal of Applied Systems Analysis*, 5, 2, 1972.
- | 17| Checkland, P., 'Towards a Systems-Based Methodology for Real-World Problem Solving', *Journal of Systems Engineering*, 3, 2, 1972; Checkland, P., 'The Development of Systems Thinking by Systems Practice' in *Progress in Cybernetics and Systems Research*, Vol. 2, Ed. R. Trappl and F. de P. Hanika Hemisphere, 1975.
- | 18| Churchman, C., *The Design of Inquiring Systems*, Basic Books, 1971.
- | 19| See (8) and the introduction to (9).
- | 20| Habermas, J., 'Knowledge and Interest', *Inquiry*, 9, 1966.
- | 21| Checkland, P., 'A Systems Map of the Universe', *Journal of Systems Engineering*, 2, 2, 1971.
- | 22| Checkland, P., 'The Problem of Problem Formulation in the Application of a Systems Approach' in Bayraktar, et. al. (Eds.), *Education in Systems Science*, Taylor and Francis, 1979.
- | 23| Giddens, A., *New Rules of Sociological Method*, Hutchinson, 1976.
- | 24| Frankel, B., 'Habermas Talking - An Interview', *Theory and Society*, 1, 1974.
- | 25| Fay, B., 'How People Change Themselves: The Relationship Between Critical Theory and Its Audience', in Ball, T., (Ed.) *Political Theory and Praxis: New Perspectives*, Minnesota U. P., 1976.