Book Reviews

Joseph FONTANET
Le Social et le Vivant
Librairie Plon, 1977, 299 pages

Nos sociétés contemporaines sont-elles vraiment ingouvernables? Ou bien plutôt les désordres qu'on y observe ne sont-ils pas provoqués par des modes de gestion devenus inadaptés à leur complexité accrue?

Telles est la question centrale à laquelle entend répondre le livre de Joseph Fontanet, "le Social et le Vivant", qu'il présente comme un essai doctrinal.

"Le style théorique d'une partie de cet ouvrage", observe-t-il, "surprendra quelques-uns. Mais je crois qu'il est temps d'essayer de dépasser le coup par coup. Nos contemporains ressentent la nécessité d'un fil conducteur à travers le maquis de la vie publique. Ils sont inquiets lorsque la politique se met à ressembler à un jeu de poker. Ils se demandent pourquoi tant de gouvernants sont si avides de s'emparer du pouvoir et si embarrassés de le détenir. La diversité des points de vue techniques, économiques, sociaux, culturels, politiques et moraux les déconcerte. Ils éprouvent le besoin d'une large réflexion générale. C'est à celle-ci que j'ai voulu apporter ma participation".

"D'autre part", poursuit Joseph Fontanet, "je ne puis me résoudre à admettre l'incommunicabilité qui fait aujourd'hui du débat politique et social un dialogue de sourds. Je pense que la droite et la gauche s'opposent à travers des clivages impropres et périmés; et qu'elles doivent se redéfinir l'une par rapport à l'autre sur de nouvelles lignes de démarcation. Je souhaite que cet essai puisse y contribuer dans une certaine mesure".

Depuis les Grecs, les penseurs politiques n'ont cessé de se demander si la cohésion de la collectivité et l'autonomie des personnes et des groupes étaient bien compatibles. Mais la crise de notre époque donne à cette interrogation permanente un relief encore plus angoissant, comme le montre le recul des sociétés libérales dans le monde entier. Faut-il douter de la possibilité d'organiser le pluralisme, la décentralisation, la participation, sans ébranler l'Etat et dissoudre la communauté nationale?

La thèse développée par Joseph Fontanet est que nos sociétés contemporaines sont caractérisées par de multiples relations entre leurs éléments, qui ne sont pas ordonnées selon le pur schéma hiérarchique classique. On y observe une pluralité de centres de décision et de pouvoirs largement indépendents: les grandes organisations professionelles et syndicales, les grandes entreprises peuvent souvent tenir tête au gouvernement. Partout, l'autorité ne peut plus s'y exercer comme autrefois. On observe même dans les sociétés contemporaines la disparition d'un système unique de valeurs de référence: le pouvoir politique ne tente plus, comme naguère, d'imposser une culture dominante à ceux qui ne se reconnaissent pas en elle. Cela signifie qu'il existe plus de critère commun pour trancher certains conflits. Ainsi s'expliquent la 'crise d'intelligibilité' et la mauvaise conscience dont nous souffrons.

De telles sociétés complexes présentent des conditions d'équilibre et de fonctionnement très différentes de celles des sociétés simples d'autrefois. Leurs comportements globaux ne sont pas les mêmes.

Or il existe toute une nouvelle science des ensembles complexes, qui à émergé dans la plupart des disciplines avancées. On l'appelle la 'théorie des systèmes'. Elle explicite et généralise ce que l'on peut en somme appeler la 'logique du vivant', puisqu'on retrouve ses concepts et ses règles structurales dans l'organisation biologique.

Mais ces concepts et ces règles s'appliquent aussi aux dispositifs 'cybernétiques' et, d'une façon générale, à tout ensemble comportant des 'auto-régulations', à base de 'retour d'informations' (ce que les anglosaxons appellent feed-back). Is s'agit de circuits ou 'boucles' d'information renseignant le centre de décision sur l'écart entre la position effective de l'ensemble et l'objectif visé. Ainsi le système se dirige-t-il par tâtonnements et rectifications de ses erreurs.

La théorie des systèmes explique ainsi grâce à quels assemblages souples et à quels processus dynamiques, des éléments, sans liaison rigide et prédéterminée, peuvent néanmoins se maintenir ensemble et conserver un comportement caractéristique.

Un bon exemple est celui des corps vivant, qui ne sont pas des montages de pièces inertes, mais des intégrations d'activités; ce qui signifie que contraire-

ment aux machines, ils se décomposent lorsque leurs fonctions s'arrêtent. Mais l'avantage d'un tel mode de structuration et de fonctionnement est d'être capable d'adaptation face aux perturbations aléatoires, grâce à se souplesse et sa nature active.

Joseph Fontanet utilise alors la théorie des systèmes comme une 'boîte à outils intellectuels' pour renouveler l'analyse des principaux problèmes de notre temps. Il propose ainsi une 'organisation politique décentralisée' fondée sur un certain nombre de réformes urgentes: celles des collectivités régionales et locales, de l'administration, du Ministère des Finances, du système éducatif, de la Sécurité Sociale, des services collectifs, etc. Il faut accroître la responsabilité des cellules de base du corps social: familles, associations, syndicats. Il faut également développer la politique contractuelle, grâce à l'aménagement de structures et de procédures efficaces de concentration et de négociation, afin de mieux gérer les tensions et les conflits qui font partie de la nature structurale d'un système complexe. Face à la dégradation du dialogue social trop souvent bloqué, l'approche systémique peut faciliter non de médiocres opérations 'récupératrices', mais, grâce à sa perspective englobante, une meilleur intelligibilité des positions en présence, première condition d'un compromis constructif.

En outre, la théorie des systèmes peut nous aider à mieux saisir l'architecture du système économique et social et à donner une vision cohérente de l'économie mixte, superposant un niveau d'autorégulation: le marché a dérouiller; un niveau de contrôle: la régulation conjoncturelle à compléter; un niveau de pilotage: le plan, dont la capacité de riposte stratégique doit étre dynamisée.

Dans le domaine international, l'approche systémique permet de comprendre les rapports de force dans le monde et de donner un sens à la construction européenne. L'analyse de l'europe, vue comme système, est très éclairante en ce qui concerne la politique à mettre en oeuvre aujourd'hui.

Le livre de Joseph Fontanet est une invitation à l'espérance. Les sociétés d'aujourd'hui ne sont pas condamnées au désarroi. L'homme n'a pas à renier les lumières de sa raison, mais au contraire à mieux les appliquer aux réalités enchevêtrées du monde contemporain; grâce aux progrès des sciences de la connaissance et de l'organisation.

Dans la préface qu'il a écrite pour l'ouvrage de Joseph Fontanet, Alain Peyrefitte le désigne comme un livre-frère de son Mal Français. "Ce qui importe,

observe-t-il, c'est qu'ils s'inscrivent tous deux dans un courant de pensée qui est en train de prendre une grande force (. . .) La crise de société ne correspond à aucun schéma marxiste et n'en peut recevoir aucune solution. Elle est une crise de la structure et du fonctionnement des pouvoirs. Chaque pays la ressent selon le caractère particulier de son organisation politique.

J'ai pour ma part cherché à établir la genèse et à décrire les mécanismes de cette particularité. Joseph Fontanet s'attache plutôt à inventorier les outils intellectuels nouveaux qui permettent de la comprendre dans sa généralité — et non seulement la comprendre: d'y survivre.

J'ai trouvé son livre passionnant (. . .)

Un livre qui sort des sentiers battus et fait découvrir de nombreux points de vue nouveaux sur des problèmes qui sont au coeur de notre vie moderne."

J. SUTHERLAND
Societal Systems: Methodology, Modeling and Management
North-Holland, New York, 1978, 336 pages

In this book, a societal system is viewed as a collection of individuals bound together by sets of interests, pursuing sets of ambitions. Seldom does one find a book so packed with information. The author is at least partially in sympathy with those who suggest that we might do well by not trying to manipulate societal systems; but he suspects that men will continue to do so. He recommends an explicitly *transdisciplinary* mode of inquiry, emphasizing that societal models must use synthetic constructs as vehicles for countering social-science parochialisms.

A *synthetic construct* is a model which seeks to reconcile competitive paradigms by raising the subject of inquiry to a higher level of abstraction. Sutherland argues that by using synthetic constructs one can find causal relationships between societal attributes that are not apparent from the perspective of any particular discipline. He sees the dialectical engine as a mediating tool, serving to connect the individual to his cultural context. I think that he is right.

The word 'dialectical' connotes a situation of conflict. Specific behaviors are products of a resolution of competitive predicates. It is through the office of dialectics that images become mixed.

Sutherland sees all societal phenomena as collisions of separate and competitive interests. According

to him, the intrinsic bases of behavior are the properties of the individual, the cultural predicates are the products of the prophets, and the contextual variables are the attributes of reality. A practical conclusion is reached: given the dialectical focus, it is possible to develop instruments that are capable of handling both individual and collective units within a single frame of analytical reference.

Among the other theses that Sutherland defends is the claim that conflict may exist *within* a human system, and that the potential for resolving conflict cannot be presumed to rest solely outside systems. One of the consequences he draws from this claim is that homeostasis is not the only rational form of societal strategy. The conclusion is interesting and exciting but is it correct? I do not think we are yet in a position to answer this question. Sutherland says that causality has to be viewed not as a one-way street, when all the determinants of system structure and behavior are exogenous, just as all the determinants of human nature were presumed exogenous by the behavioristic school. This is perfectly correct, but the answer may be found by considering the important concept Sutherland combats, namely *equilibrium*. The tendency to equate system quality with stability of structure through time is also a characteristic of a dialectical approach. Here we speak about the stability of an evaluation system. In fact, humans pull back on higher levels of synthesis in order to get structural stability (Human Systems Management 1 (1980) 71—76).

I quite agree with the author that a key to human systems management is to breach the hold of the *incomplete* dialectics, the engine that finds us constantly substituting conflicting evaluations, but never defining a point of synthesis. However, synthesis means equilibrium as a state of balance between conflictual evaluations. Maybe this concept of 'equilibrium' can elucidate the sense in which 'fixed' is to be taken in statements like " it is through prophets that the bounds of societal consciousness can be fixed".

Sutherland's clear premise is that culture exercises a tremendous influence on individual behavior, and that prophets determine the course of societal events. The foregoing statement is bold and crude indeed. Sutherland supplies all the necessary elegance, precision and explication. This is not concerned with the fine grain of what he makes of his premise. The thesis is defined by introducing the 'corridor concept': most empirical and historical societal systems have tended to concentrate societal benefits in one dimension, or a 'corridor', at the direct expense of the other dimensions. It is also my feeling that here is the crux of the societal problem and also the seed of its solution.

That Sutherland raises more questions than he answers is hardly a criticism of his work. Together with Georgescu-Roegen (Human Systems Management 1 (1980) 98—99) he tried to remade dialectics, so often an arena of sterile debates, into an exciting instrument of scientific inquiry.

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Jared L. COHON
Multiobjective Programming and Planning
Academic Press, New York, 1978, 333 + xiv pages

Both public and private sector decision-making are complex processes characterized by *multiple conflicting objectives* and goals. Those who are familiar with operations research and management sciences should recall their persistent emphasis on *single-objective* formulations (minimize costs or maximize sales dictum): a feature which was instrumental in causing their stagnation and might have brought about their ultimate downfall. Single-objective approaches degraded the role of the decision maker by allowing him only to accept or to reject a mathematically derived decision. No value judgments were needed, no trade-offs considered. Multiobjective approaches, in contrast, systematically explore project alternatives and explicitly consider the range of choice, the relationship between alternatives, and the relative values of the competing objectives. In this manner the responsibility of assigning relative values remains where it belongs: with the decision maker.

Cohon's book appears as the 140th volume in *Mathematics in Science and Engineering,* an Academic Press series edited by R. Bellman. After several textbooks of questionable quality and hot-needle composition (mostly of the goal programming fame), the fields of multiple criteria decision making and multiobjective programming are receiving a proper representation in this well-written and well-argued book.

Main emphasis is on mathematical programming with multiple objective functions (*multiobjective programming*) and its applications in planning and

public decision-making. No previous knowledge of classical linear programming is needed: the book is both introductory and self-contained. Cohon dispels the tired myth of some operations research writers that one has to learn all about single-objective analysis before advancing to supposedly more complex and more involved multiobjective analysis. This is often presented as an excuse for not including enough multiple criteria material in operations research textbooks. Consequently, large cohorts of students have been passing through their studies without even hearing about the conflicting multi-objectivity of the real world. Cohon shows that it is actually the opposite approach which is more natural and educationally more satisfying: expose the reader directly to the multiobjective situations and their analysis; the entire single-objective methodology, if needed, can then be derived as a simple and rather straightforward special case.

First two chapters contain quite interesting introductory material on multiple objectives, especially as they appear in the public sector. In Chapter 3 there is a short but comprehensive and entirely adequate review of linear programming. In Chapter 4 the multiobjective solution concept of noninferiority (non-dominance) is introduced and discussed. In Chapter 5 Cohon offers a classification of multiobjective programming methods and discusses their applicability to public decision-making. Some specific techniques are then described and operationalized in Chapter 6: the weighting method, the constraint method, the nininferior set estimation method, and the multiobjective simplex method.

Methods that incorporate decision maker's preferences are then discussed in Chapter 7: multiattribute utility functions, compromise programming, the surrogate worth tradeoff method and iterative (i.e., *interactive*) techniques. Chapter 8 deals with the problem of aggregation of individual preferences in situations where multiple decision makers are involved.

Chapters 9 and 10 present cases of real-world applications. It is in these chapters where Cohon's practical experience really shows through. Over the past ten years, Dr. Cohon has been involved in a large number of projects and his one year of work in the Senate provided him with the hands-on exposure to public discision making. All his experience is now being generously shared. There is a detailed and complete case study of multiobjective river basin planning, cases of fire station location and regional

energy facility location problems.

The implicit motto of the whole book, "analysts should analyze and decision makers should decide", is sound, difficult to argue about and fully supported by Cohon's discussions. He rejects single-objective analysis, in a public decision-making context at least, because the decision makers are left with the choice of accepting or rejecting its single solution without learning anything about how the solution compares with other feasible solutions. Also, the analyst is forced by single-objective approaches to usurp a large part of the decision maker's responsibilities.

Cohon does not hide his fascination with multiobjective analysis and its role in the solution of public decision-making problems. He wishes and hopes that also others would become fascinated with this topic. *Fascination* – a word which has disappeared from operations research, systems analysis and decision theories many decades ago. We should be grateful to Dr. Cohon for bringing the sense of purpose, excitement and joy back into these fields: his book is not a pompous capstone to their great past – it represents a modest beginning of a new and even greater future to come.

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Stephen A. TYLER
The Said and the Unsaid,
Academic Press, New York, 1978, 487 pages

There is now evidence of a growing awareness of scientists that mathematical theories, if they claim to deal with social phenomena, must be subjected to the same kind of critical discussion that is widespread in the natural sciences. The extent to which a theory constitutes a valuable addition to our knowledge depends very strongly on its ability to be challenged and to successfully withstand the challenges. It follows that criticism should be an integral part of scientific activity and that efforst to challenge existing theories are necessary for scientific progress.

Stephen Tyler challenges the intellectual poverty of formalism. He says that *language* is not only for representing ideas but is equally a means for expressing wishes, feelings and emotions – that is the way of getting things done in this world as well as making

statements about it. In essence, his focus shifts from the language itself to what people *do* with language. This is a potentially fruitful point of view, and, in what follows, I shall project the book into the management science framework. In other words — the individual, in his *decision taking* assumes a more important role than he does in decision making. What we take to be someone's intensions, purposes, plans, and attributes are clues we use for interpreting what he means. Consequently, meaning is a matter of interpretation rather than of the automatic translation of preordained instructions meanings. Meaning is therefore a variable phenomenon distilled from the decision maker's intentions and decision taker's interpretations.

Functionalism, by emphasizing what we might call the outer appearances of a decision, asks not how the decision is interpreted but how it creates appropriate effects in others. Clearly, conventionality is not possible if each of us has a different experience of the world. In fact, the experience of each of us must be both the same and different. Tyler notes that formalism errs on the side of sameness and functionalism errs on the side of difference.

Where the formalist seeks to exorcise ambiguity, the functionalist encourages us to look at the uses of ambiguity. Rather than a problem to be overcome, ambiguity is a necessary feature of language which we suit to our own ends. The formalist's dream of explicitness — of complete and unambigous semantic interpretation — contradicts our common sense. Without ambiguity, communication becomes simply impossible. At this point, I should mention that the formalist seeks (at the moment) to characterize the structure of ambiguity; but this is another story.

As with ambiguity, so too with silence. The formalist forgets that what is not said, either by way of implicitness or through silence itself, is often more important than what is said. Silence may communicate what is beneath words or beyond them, but in either event it is part of our means of communication.

Our common sense teaches us that there is something odd about looking at the decision making and decision comprehending as simple inverses. We know from our experience that comprehending appears either before or in the absence of producing. This indicates that we cannot produce decisions without first knowing how to understand them and that we know about something before knowing how to put it into practice. In other words, structure is a pre-

condition for performance. We have an intention which precedes the decision and fulfills it. Understanding of what is decided is accomplished by reproducing its form or function.

The fundamental presupposition of decision making is that it is addressed to someone other who can come to its understanding. Even our inner dialogues have this character. They are addressed to ourselves as if to some external 'other'. This argument does not maintain that the other's understanding comes automatically or easily, or even that the other comes to the right understanding; it only presupposes that we *assume* that the "other" can come to the right understanding. But we all know from our daily experience that we are often misunderstood, no matter how hard we may try to make our thoughts clear; each of us sometimes feels that no one could ever understand our innermost thoughts in quite the way we do.

What is important is the fact that schemata of meaning are constructive. They facilitate the construction of meaning from incomplete or otherwise defective utterances. If we had to wait for an utterance to be completed, before beginning to understand it, conversations would be filled with long pauses. While the decision taker would desperately try to work out the meaning of the after-the-fact utterance, the decision maker would quietly wait to see if his instruction can be deciphered. This is one of the great weaknesses of the notion of semantics as something to be extracted or deciphered from an already completed utterance.

Although this book was not written for management scientists, it seems to me that they could find in it new cores on which to build new understandings.

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V. VEMURI
Modeling of Complex Systems
Academic Press, New York, 1978, 448 pages

The mellower subtitle, "An Introduction", is a better description of the content than the somewhat arresting title given to this book. As the author himself states, scientific and technical developments in the past few decades have set the stage for an era

characterized by bigness, by systems that are more complex than the familiar engineering systems on which so many textbooks are based. We are now speaking of large systems characterized not only by their geometrical largeness but also by a structure, behavioral or social in its nature. The term 'large-scale' itself is subject to value judgements. As it stands today, the theory of large-scale or complex systems, if any such thing exists, is more a state of mind than any specific amalgam of methods or philosophies. The author feels, however, that sound mathematical and logical thinking must occupy an important position in any large-scale systems theory, and, to this end, bits of knowledge have been collected and organized in this book to fill some of the needs outlined above.

Although — almost inevitably — there are one or two areas in which the text barely goes beyond exhortations to good housekeeping, the greater part of it deals with practical, proven methods of system analysis. The target audience at which the book is aimed is defined as being the new breed of undergraduate students interested in a multidisciplinary approach to complex problems of contemporary societal interest. On the assumption that the current societal problems will inevitably catch great numbers of these students with their trousers down, Vemuri's approach is to focus on all the areas amenable to control, and to indicate the appropriate means of analysis. The underlying thesis is that with external pressures forcing human systems to fight for their survival, it is better to have a planned program for survival rather than to adopt — as many have and more will — a management by crisis.

The author knows that complex systems are not static, that many large-scale systems problems are characterized by a conflict of interests in the goals to be pursued, and that a significant practical aspect of a problem is not even a question of control but one of learning enough about the system to permit the development of a meaningful policy for its operation; an attempt to engineer the system, that is to steer it in the proper direction. He also knows that political decisions depend upon public reactions, social values and priorities. Since a society is a collection of individuals, methods are required to aggregate individual values and preferences into social values. Vemuri notes that this is a potentially fruitful area for future research. So do I.

The author goes on to examine how to handle complex systems. He observes that years of experience with expensive research clearly show that a good guess is all that is needed for a major breakthrough. While intuition cannot possibly be taught, one can be helped in making inspired guesses by developing a mental framework. In the absence of an intuitive grasp of a subject one has to resort to more systematic methods of inquiry. Central to this inquiry is a concern about questions such as, "What permits us to predict the behavior of a system?"

It appears, according to Vemuri, that there are five basic approaches to the scientific truth:

— The Leibnizian approach, based on the premise that truth is analytic. Therefore, a system can be defined completely by a formal or symbolic procedure.

— The Lockean approach, based on the assumption that truth is experimental. This implies that the validity of a model does not rest upon any prior assumptions. Among the Lockean methods of approaching complex systems problems, special mention is made about the Delphi technique where opinions of a large group are required to treat an issue adequately.

— The Kantian approach, based on the assumption that truth is synthetic. That is, experimental data and a theoretical base are inseparable. This approach can be incorporated into the Delphi technique, ideally suitable for ill-structured problems.

— Central to Hegelian approach is the precept that truth is conflictual. The union of conflictual opposites leads to a more adequate grasp of the nature of things until finally all possible points of view, with all their seeming conflicts, become the constituents of one comprehensive system. I have some doubts that this is exactly what Hegel had in mind. Anyway, one important fact underlying the dialectical approach — and this is what we are talking about — is the recognition that data is not information. Information results from an interpretation of data; hermeneutics if you want. The same data can be used to support conflictual models.

Some may be tempted to argue that — as presented here — there are significant links between these approaches, and I am one of them. It is true that Leibnizian approaches are suited to problems involving a well-defined structure in which the underlying assumptions are clearly definable. But a well-defined structure can also be found in the Delphi approach. Because of the lattice-like structure of the set of all subjective evaluations-naturally induced by

such structure and underlying any subjective evaluation, subjectivity is reduced. That is, no matter how subjectively one is looking at the real world, by aggregating many subjective evaluations an objective evaluation is finally reached. The same reality can be modelled in many ways, and, to avoid the undecidability generated by conflict, humans pull back on higher levels of synthesis. This is the case, for instance, with the so-called dialectical inquiring, which attempts to identify different points of view as to how to cope with a situation. The hope is that out of a dialectical confrontation between conflictual interpretations, the underlying assumptions of the Leibnizian model is brought to the surface for a conscious appraisal.

I could not pretend that this book illustrates this hope. It would have helped if some consideration had been given to recent developments in multicriterion decision-making, autopoiesis, and fuzzy systems (topics not included in this book) but for all the criticism, the book contains a wealth of useful material.

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