Reviews

Humberto R. MATURANA and Francisco J. VARELA
The Tree of Knowledge
(The Biological Roots of Human Understanding)
New Science Library, Shambhala Publications, Boston & London, 1987, 263 pages, US$ 24.95.

Those who have been active in the areas of autopoiesis, cognition and knowledge acquisition will appreciate this popular and pictorial summary by Maturana and Varela. Those who still consider themselves uninitiated to autopoiesis have still another chance. Except, it seems at least to this reviewer, to appreciate the popular version one has to digest and fully understand the scientific one: to start with the popular can be a good guide and entry into the scientific; to start and stay with the popular would be a disaster.

There will be countless cybernetic 'kids' who love to gather around and sit at the feet of their gurus, whispering: 'this languaging is mind-boggling', and thus quietly spelling the end of cybernetics. Many of them will never take the time to plough through the science of autopoiesis, never explore it through the computer, never attempt to expand its own boundaries. They will welcome this popular summary and many will 'stay with it': they will make autopoiesis a loose and flaky 'in-thing', full of 'aaahs' and gasps, overwhelming their minds. This, I propose, would be the exact opposite of what Maturana and Varela could have had in their minds as a purpose.

And as they do, so I too hope, that the above scenario never comes to its realization.

That something very sad is actually happening was brought home when a young secretary asked me what kind of conference I was attending. 'Cybernetics', I replied, getting ready to explain. 'Oh, I know that. Cybernetics is very popular among young secretaries in the office. It is all about the higher consciousness and how to relate to the world and stuff, isn't it? It is mind-boggling.'

Maturana and Varela's 'stuff' is mind-boggling, as most of their work is, but in an entirely different sense and for entirely different reasons. In their impatient quest for recognition they have become isolated in the sea of too many 'mind-boggled' minds, while rejecting and alienating serious, calm and only sparingly admiring researchers and scientists. This book could be their way out, or it could pull them even deeper into the sea of mostly noncomprehending admirers.

Just consider the blurbs. Fritjof Capra chooses their 'stunningly beautiful conclusion': ... we have only the world that we bring forth with others, and only love helps us bring it forth.' This happens to be as beautiful a phrase as it is empty: why hate, ambition and unhappiness are as powerful 'helpers' in bringing forth our knowledge as love could be. But *love* has been singled out and the 'flower children of cybernetics' are gathering and sitting down on the floor already.

How much more beautiful, useful and reflective of their mature experience, even though 'unselected' by 'lovers', is authors': 'We affirm that at the core of all troubles we face today is our very ignorance of knowing.'

Or, from the other side, consider the message of J.Z.Young's Foreword, coming directly from Oxford University: 'Dr. Maturana and Dr. Varela, well known for finding new approaches in nerve physiology, have produced a truly original book, which will be a revelation and inspiration to many people.'

Now, is this one good or bad? Is it an arrogant sneer, cold indifference, cautious judgment or non-committal acknowledgment that 'masses might like it'? I do not presume to know, but both examples indicate the kind of difficulties Maturana and Varela (and their autopoiesis) are facing and will continue to face.

You see, you don't tell nuclear physicists or molecular biologists that '...an explanation is always a proposition that reformulates or recreates the observations of a phenomenon in a system of concepts acceptable to a group of people who

share a criterion of validation.' Where is the objective reality? Scientific truth? The beef?

Or take: 'Cognition is an effective action' and try to explain *that* to some AI manipulator or 'computator' of even more artificial symbols. 'An object is brought forth by an act of distinction'; i.e., it is not 'computed', 'photographed', 'perceived', 'copied', etc., it is brought forth by a subject through an act. That each individual can bring forth the same object in different ways need not be stated.

Or make molecular biologists to listen to: 'We have often heard it said that genes contain the "information" that specifies a living being. This is wrong for two basic reasons.' The pre-scientific and anthropomorphic notion of 'information' residing in a specific component and 'telling' other components 'what to do' needs to be 'blasted off' much more vigorously before we 'progress' beyond the point of no return. DNA, like political constitution, is an essential component of transgenerational stability of the cell or social system; like political constitution it contains no 'information' that would specify system history. The error lies in confusing *essential participation* with *unique responsibility*: everybody in 'modern science' seems to be doing it and getting away with it.

Autopoietic categories of *organization* and *structure* are well known and therefore (perhaps) not covered in great detail in this book. There are some idiosyncracies too: e.g., using a 'water toilet' as an example of an organized system or accepting Miller's infamous 'witchcraft' hypothesis (that life has begun when 'pregnant' waters were struck by a bolt of lightning) are simply cute and minor 'slippages' in the grander design of the book.

Maturana and Varela finally talk about 'operationally closed' systems rather than about 'closed' systems. The term 'closed' used to turn off many systems 'groupies' who saw it as an attack on their cherished (and totally empty and trivial) notion of an 'open system'. (To insist that systems are open when there are no 'closed' systems in nature is redundant, but poetic.)

Or try to explain to emerging 'knowledge engineers', fiddling with their fuzzified knowledge bases through symbolic manipulation, that: 'We admit knowledge whenever we observe an effective (or adequate) behaviour in a given context, i.e., in a realm or domain which we define by a question (explicit or implicit).' So, knowledge *is*

action (not symbol manipulation) and it is always in a given context (not context-free): try to explain *that* at a conference on 'knowledge engineering'.

Or take language and try to explain it to the symbolists of modern linguistics: 'Language is an ongoing process that only exists as languaging, not as isolated items of behavior.' This is powerful, but almost completely misused by those admirers who start running around insisting that *now* they are 'languaging'. What Maturana says is that language cannot be separated from coordination of action and that we exist *in* language as we do *in* our actions. The key feature of language is that it radically modifies human behavioral domains and makes possible new phenomena such as reflection and consciousness. Tell *that* to a linguist.

In pre-scientific world there are two levels of innocence: not knowing and knowing without knowing it. Either we do not know that we are naked or we know it. It is only when we know that we know we are naked when we lose our innocence, irreversibly and forever. Modern science is in its last stages of innocence: it simply knows, but it has no knowledge of its own knowledge.

Maturana and Varela are giving modern scientists the first taste of the science which is not innocent, which is sinful, which is the only true science that compels and transforms, forever. They invite scientists to eat from the forbidden tree of knowledge and thus lose their cherished innocence (of striking bolts of lightning).

But the scientists can choose not to read the book, or, after reading it, not to take a bite. The book might be read by the eternal 'groupies' of (cybernetic) science only and *they* can never lose their innocence, they can never know that they know, because they do not know in the first place. What a waste that would be.

Oh, what do I think of the book? BRILLIANT. But then, I probably remain biased, after all these years... I lost my innocence in 1974.

When I first read *Mind and the World-Order*, outline of a theory of knowledge by Clarence Irving Lewis. Pity that the authors *still* do not acknowledge it.

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C. ARGYRIS, R. PUTNAM, and D.M. SMITH
Action Science
Jossey-Bass, San Francisco, CA, 1985, 449 pages.

E.E. LAWLER III, A.M. MOHRMAN, Jr., S.A. MOHRMAN, G.E. LEDFORD, Jr., T.G. CUMMINGS and associates
Doing Research That is Useful for Theory and Practice
Jossey-Bass, San Francisco, CA, 1985, 362 pages.

Is it possible to design research in the social sciences which not only contributes to theory, but is also truly useful in a practical sense? This is the question addressed by these two books, both of which offer valuable insights for those studying individual and organizational behavior.

The authors of *Action Science* point out that often efforts to apply rigid traditional scientific method in social science research tend to distort reality, and fail to discover solutions to pressing social problems. Action science aims to bridge the gap between 'dry theory' and practical application: it 'can be used to solve problems, enhance human development and learning, and promote individual, organizational, and social change.' This methodology should be of interest to organizational consultants, managers, educators, social psychologists, or anyone interested in problems of human interaction.

In the authors' opinion, social science should challenge the status quo in order to generate creative solutions to problems. Action science helps develop critical thinking skills which enable us to transcend our automatic assumptions about reality, and to change our patterns of thinking. Research which challenges the established order can be threatening to individuals and to members of an organization, but the authors maintain that change is often critical to survival. Action science suggests ways of working through human defense mechanisms to bring about positive change. Since theory here leads to action, which entails consequences, action scientists must carefully consider the ethical implications of their work.

Action Science is well organized, and very readable. The authors clearly articulate their objectives which correspond to the three parts of the book: (1) 'to identify some of the primary issues in the philosophy of science that relate to action science...', (2) 'to identify similarities and differences in the methodology of normal science and action science and to examine the implications of these for the skills that researchers may need to be action scientists,' and (3) to show how action science methods can be taught. The summary of scientific theory is surprisingly lively and thought-provoking; the authors are careful to define concepts and clarify theories with concrete examples. The final section also includes case studies to demonstrate the application of action science methods, in keeping with the philosophy of the book.

Doing Research That is Useful for Theory and Practice should also be of interest to social science researchers who are concerned with solving problems as well as building theory. The book grew out of a conference on this topic sponsored by the Center for Effective Organizations and the School of Business Administration of the University of Southern California. A number of noted organizational researchers were asked to share their own research methodologies. Creative discussion was generated and synthesized in this book.

Part I, 'Doing Useful Research: An Introduction to the Issues', raises basic philosophical issues encountered in designing research which is both scientifically valid and practical. Traditional research methods are challenged. One contributor suggests, for instance, that researchers must be careful not to isolate themselves in academic theory. They must keep abreast of current management practices within industry, and should try to develop working relationships with knowledgeable members of the organization they are studying. The author warns that practical results of a study could be sacrificed by slavish devotion to rigorous scientific methods. Often new 'frames' or ways of looking at things are just as useful as factual information. Also, researchers should not be intimidated by large projects which would yield very useful information simply because they would be too difficult to tackle with traditional tools.

In Part II, 'Alternate Approaches to Doing Useful Organizational Research', individual authors describe their own successful research. Each represents a unique perspective. What is especially interesting about this approach is the range of choice given the reader: the methodologies introduced are innovative and have proven

themselves in practice. The reader is free to select and combine ideas which best serve his/her purposes. What is exposed in the book is the process of analyzing research approaches. For the reader this is a good exercise in critical thinking. Just when he/she has been dazzled by a convincing argument for a particular methodology, another author adds a critique which challenges the assumptions of the first.

Part III, 'Comparing Research Approaches', summarizes and critiques the exploration of methodologies. The authors conclude that there is no 'one best way'. However, the different contributors have a common awareness of the necessity to focus on the process of change within organizations, and hence of the importance of finding innovative ways of studying and dealing with that change.

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M. LONDON and E.M. MONE
Career Management and Survival in the Workplace
Jossey-Bass, San Francisco, CA, 1987, 211 pages.

Against the background of an increasingly competitive environment for organizations, which are continually pressed to streamline for efficiency, London and Mone focus on the problems facing employees attempting to advance or simply hold on to their careers. It is the authors' contention that as corporations strive to compete, often by reducing their work force, opportunities for career growth decline, and employees are forced to concentrate more on mere survival than on career advancement. *Career Management and Survival in the Workplace* is directed toward human resource professionals seeking to help people manage their careers and stay motivated in today's uncertain environment.

On the positive side, the authors note that corporate management styles are shifting from authoritarian to participatory; corporate struc-

tures are becoming more flexible. This allows employees more responsibility and independence. Individuals must be creative in directing their careers. *Career Management* provides a number of tools to aid people in such 'flexible career planning'.

Part I focuses on the career decision making process. The authors summarize reasons for a career change and suggest ways in which human resource professionals can help people clarify their goals and their skills, then identify appropriate career opportunities. Various decision-making strategies are illustrated with case studies, which contrast the range of decision-making styles from intuitive to rational. Finally, commitment to a job decision is also considered as a factor in a person's freedom to consider career options. According to the authors, 'positive problem solvers' are often successful in career choices. They are 'self-confident', have a need for achievement, are willing to take risks, and know when and how to act on their own.' Part II explores employee motivation factors. Personality characteristics which affect a person's relationship to his/her career are grouped into three 'dimensions of motivation'. *Career resilience* is defined as self-confidence and the ability to take risks. *Career insight* is knowledge of one's strengths and weaknesses, and sensitivity to opportunities in the environment. *Career identity* is 'the extent to which people define themselves by their work.' This will determine what goals a person will have within the organization.

This section of the book contains several ready-to-use tools for assessing employee motivation and career direction, including a checklist describing the career motivation dimensions, a self-assessment audit, and a career balance sheet and income statement (assets, receivables, liabilities, debt, risk, etc.).

Part III deals with career stress. The authors look at causes and reactions to stress, and then suggest strategies for dealing with it. A sample questionnaire for identifying sources of stress is included. The suggestions offered here, and throughout the book, are practical, and useful both for individuals and for organizations as a whole.

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Guy BENVENISTE
Professionalizing the Organization: Reducing Bureaucracy to Enhance Effectiveness
Jossey-Bass, San Francisco, CA, 1987, 270 pages.

In *Professionalizing the Organization*, Guy Benveniste tackles Bureaucracy, as he focuses on the question of how best to manage professionals within an organization. He asks: 'How can management use professionals as problem solvers instead of paper pushers?' He defines professionals as those who have specialized knowledge or expertise in a field: doctors, lawyers, scientists, engineers, teachers, health and social workers, and museum curators, to name a few. Starting from the premise that the traditional bureaucratic style of management is not effective for managing professionals, he seeks to determine 'how organizations can be redesigned to make the most of the expertise and experience of their professional staff – and so become more adaptive, productive, and competitive.' He goes on to suggest alternative organizational designs better suited to organizations which depend on professional knowledge and skills to carry out complex tasks, such as engineering firms, research organizations, health and social service organizations, think tanks, or educational institutions.

The author has excellent credentials to offer insights on this subject. He has served as a professional in private, non-profit, government, and international organizations, including the Standford Research Institute, the U.S. State Department, UNESCO, and the International Bank for Reconstruction and Development. The book is interspersed with real-life anecdotes and case studies, which illustrate the concepts he introduces.

Professionalizing the Organization would interest managers of professionals, or anyone interested in organizational design. Benveniste also suggests the book would serve well as an introductory text on organization theory and management. He focuses on structure, rather than interpersonal power relations, highlighting elements of the organization such as corporate culture, the organizational hierarchy, task assignment, performance evaluation, rewards and punishments, and communication channels.

Benveniste begins by contrasting the two management styles, bureaucratization and professionalization, pointing out the circumstances in which each works best. Bureaucratic routinization is inappropriate for complex situations where creativity and flexibility are essential. These tasks are better delegated.

The author next characterizes the behavior and values of professionals which point to appropriate motivational management techniques. He explores the dynamics of power relationships between managers and professionals, introducing the concepts of envelope supervision and joint managerial-professional tasks. He describes five management models: partnership, senior staff, dual governance, collegial, and conventional bureaucratic.

In suggesting strategies for controlling the future direction of an organization, Benveniste weighs the benefits of 'incomplete' planning over those of 'comprehensive' or 'strategic' planning. He compares the effectiveness of several management tools, including programming, management by objective, performance monitoring , and rewards and punishments. Methods for encouraging risk taking and controlling errors are also suggested.

After examining ways in which profession-oriented organizations can cope with external controls such as governments, the author turns to the future. He hopefuly concludes: 'The profession-oriented organization is more effective than a bureaucratic organization, so it should win out in the long run.'

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Robert BRINKERHOFF
Achieving Results from Training
Jossey-Bass, San Francisco, CA, 1987, 234 pages.

According to Brinkerhoff, the amount of resources invested in human resource development within organizations is 'tremendous' and growing. However, according to a recent survey of major corporations, less than half of these programs are ever formally evaluated. Noting the vital importance of such assessment, Brinkerhoff offers a systematic model for evaluating HRD programs, and for proving their 'bottom-line' value to the

company. The book is intended to help readers, particularly HRD professionals, 'design and conduct better programs and collect data to demonstrate the impact, value, and worth of HRD functions.'

Throughout his career, the author has been involved in evaluating training programs in government, public education, business, and industry. His unique method combines the results-oriented business approach to program evaluation, with the emphasis on improving the program common to the field of education. His six-stage model has been applied successfully in many areas, including training for HRD practitioners from around the world, and graduate courses in HRD.

Each chapter describes a stage of his model, and presents key decisions to be considered at each step. In the first stage, the program designer must select a goal which will be of obvious benefit to the organization. He/she must determine a need for HRD intervention in a particular area, and specify the benefits. In Stage II, 'a workable program design is created'. Appropriate questions are: What learning processes will bring about the desired changes? Are there already programs available or will one have to be designed? In Stage III, the program is implemented. The designer must analyze its operation: Is it being implemented as planned? Is it working? How should it

be changed? In Stage IV, the trainees have completed the program, and one must ask: 'Have they acquired the target "SKA" (skills, knowledge, attitudes), and can these be applied on the job?' Stage V focuses on the application of new skills to the job or personal life. Has the training had a lasting effect? What kind of effect? Who is using which new SKA? Stage VI evaluates the actual benefits to the organization, looks at problems, changes needed, and finally asks, 'Was it worth it?' This analysis includes the gathering of cost–benefit data. Brinkerhoff outlines a basic strategy for collecting and analyzing data, and then refers the reader to other more detailed sources which describe different approaches to evaluative data collection.

The author concludes with a reminder that his Six-Stage Model is an ideal, which will be altered by the real constraints of the organizational environment. He warns, however, that neglecting to rationally justify valuable HRD programs to corporate management may well endanger their continued existence in a competitive environment, where all functions are vying for limited resources.

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