Preamble

COOPERATION AND COMPLEXITY IN SOCIOTECHNICAL SYSTEMS

It is an honour for myself to be invited by the editors to compose this preamble to their book. As they themselves will write a preface to present their objectives and the content, I am not going to make a parallel discourse which would appear very imperfect compared to theirs, because they are much more competent than myself to introduce the theme. More simply, I would like to make some general remarks about this theme and the content of the texts, trying to communicate my interest for this book. First of all, we must be grateful to those who had the idea for this book, managed its preparation and succeeded in this cooperative work which was not likely without difficulty. With such a pair of general concepts, the way has been opened to express various perspectives and styles of contributions: this variety is advantageous in providing different viewpoints on complexity and cooperation.

In this short preamble, I will begin to place this book in the context of past French works on the theme, from my own experience, as modest actor in the concerned field. This will give non French language readers an idea of sometimes less known research, because of the language difficulties. It will also provide some historical background which will help to understand better the texts within this book.

As a work psychologist, I was early oriented to the problems of ergonomics, at a time when the word of ergonomics was not yet in use. My first professional contact with cooperative work comes from an international research activity concerning safety (1962-68) initiated by the European Community for Coal and Steel. I had to write (with the aid of X. Cuny) a report which synthesized the work of five national researches. In this report1 was a chapter named “Safety and work group”. At the

same time (1966), my old director, J.-M. Faverge became a professor at the Free University of Brussels, where he edited a book entitled “Ergonomics of industrial processes” in which was a part concerning the “regulation of teamwork”. Here were the likely marks, among some rare other ones, of the beginning interest for the collective dimension of the activity in the psychological and ergonomic studies of work situations. From the nineties, this interest was growing quickly. An important step for French ergonomics was the 27th congress of the SELF (French language ergonomics society) devoted to the “collective aspects of work” (proceedings published in 1993). I don’t intend to make a bibliography of the studies which followed: I would simply mention some collective books on the theme from B. Pavard, G. de Terssac and E. Friedberg, T.H. Benchekroun and A. Weill-Fassina, M. Grosjean and M. Lacoste. I should also not forget the original research conducted by A. Savoyant in my Laboratory, emphasizing its distinction from the classical research of social psychology which focused on the allocation and coordination of tasks. Savoyant, however, defined a problematic of the cooperative activity focused on the task execution. I would like also to mention a special issue of “Le Travail Humain” devoted to “Collective work”, with four parts: 1) problematic and concepts; 2) construction of collective activity; 3) communications in work: models and methods; 4) aids and obstacles to collective activity. Concerning the second concept, “complexity”, we wrote personally (1996) a chapter about “some aspects of the complexity in ergonomics” in which we tried to identify factors of complexity and to develop the notions of distributed complexity and complexity management. We mentioned in the conclusion the interest of taking into account “the collective aspects of complexity”.

After this brief historical overview of some French works evoked by the two associated words of this book title, some questions will be posed which can prepare for an active reading of the book. As our objective is not to make a critical analysis, we will not mention the authors and the texts which could answer these questions, leaving this task to the editors!

— In front of the large space opened by the two words, cooperation and complexity, authors of the chapters have introduced some specifications with the

concept of system. They speak of cooperative system, of complex system, at the same
time, of socio-technical or technical-organizational system. What do we learn when we qualify a cooperative system as complex? Is it possible to define degrees of complexity? Considering previous texts cited above, one can think that many of them could appear in this book: therefore, the question is: what is the novel contribution brought by this book? What is the real interest of the notion of complexity and what questions does it pose in the texts?

– An important and often noted feature of complex cooperative systems is the difficulty to foresee the results of their functioning. Nevertheless, we must live and we live with or within such systems. How do we do this? What rules or principles can be used to cope with this difficulty of prediction? What is the relation between unpredictability and self-organization, creativity?

– Complex cooperative systems evolve: they have a history. Their human, as well as their technical components grow old and their properties change according to the point in their life cycle. It is essential to know the factors which influence this evolution if some of its effects are to be controlled. But complex cooperative systems evolve not only with their age: they can also momentarily transform themselves to cope with unforeseen problems. Temporary systems which don’t match up with the official systems can develop to answer to these problems (for example, members belonging to two groups joint together informally to solve an incident). This notion of evolution is linked to the notion of memory: what are the characteristics of collective memory, its aids, its ways of storage, how do this intervene in collective work?

– The notion of cooperation and communication are tightly connected. Therefore, it is important to examine how the communications are organized, how their aids are designed and can intervene in the management of the complexity of the system, how can new technologies be used to tackle some problems of communication, in particular to improve systems safety.

Here were summarily presented some questions among many others which are raised by the connected notions of cooperation and complexity. The authors propose issues within which responses or elements of response can be found. These problematics are varied, but they have common concerns, concern of rigor and the need to align the research with a theoretical framework in order to articulate it with other research. If references are only considered, the intersections between the different approaches are not very large, however we have the impression of a common view about what defines seriousness of research in this field: this makes possible exchanges which can be favoured by this book. After reading it, readers will have enough information to assess if the introduction of the concept of complexity can brings a substantial benefit to the analysis and study of cooperative systems. Whatever response will be given, the presented texts constitute a significant contribution to the study of cooperative systems.
This book must interest all people concerned with the study of collective aspects of activity in work situations, in particular, situations involving advanced technologies. Theoretical and methodological aspects of the research discussed in these pages will be appreciated by specialised researchers. This book will also constitute an excellent work tool for the students involved in disciplines which take into account the collective dimensions of work.

Jacques Leplat,
Laboratoire de Psychologie du Travail
EPHE, France
Jacques.Leplat@wanadoo.fr