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**DE MAURICE ALLAIS
À ÉMILE DURKHEIM
Itinéraire d'un chercheur en gestion**

with

Claude RIVELINE

I. INTRODUCTION

Raymond-Alain Thiétart :

Both of our guests are mathematicians who have distanced themselves from their original disciplines. Claude Riveline has moved towards a naturalist approach to the study of organisations with Sociology and Ethnology. Bernard Roy has modified a variety of mathematical models in order to make them more user-friendly within organisations; he argues for Decision-Support Science as opposed to Decision-Making Science and, two years ago, he was awarded the Euro Gold Medal for his outstanding contribution to Applied Mathematics.

Bernard Roy :

It is impossible to label Claude Riveline: engineer, sociologist, psychologist, teacher, consultant, he belongs in part to all of these tribes. But he must find it difficult to conform to all of their specific rites and I don't believe that he is about to limit himself in the name of any of their basic myths.

In 1967 he founded the Centre de Gestion Scientifique, which he directed until 1975 when Jean-Claude Moisdon took over as Director. In the early 1960's he was fascinated by Mathematical Economics, the theories of Maurice Allais and Jacques Lesourne. But in the organisations he worked with he soon discovered that things were not strictly ruled by the law of Profit Maximisation, nor even by any other single criteria. Therefore, transposing mechanical rationality to business management was doomed to fail. I too, at the time, was drawn by a mathematical vision of management: it is both reassuring and rather intellectually satisfying. Without knowing each other, we were both moving away from a vision that did not fit with our practical experience.

Claude Riveline was pushing the students, teachers and researchers around him to go out into the field and collect ethnographic data - which was not at all the done thing at the time. Over the years, with the help of others, he created the basis of a sort of general theory, which he calls "new and specific compared to the contributions of the Schools of Human Relations and Applied Mathematics". He developed his ideas with publications in various revues such as *Transportation Research*, *Futuribles*, *Gérer et Comprendre* and more recently in *Le Réverbère*¹.

He acts as a consultant and advisor to many institutions he tries to jolt out of their usual intellectual routines ; he likes to provoke people into fresh thinking. Last but not least, he is a teacher who defends ideas that can seem a bit "far out" but are deeply thought out, and who develops original teaching methods. In any case he obviously leaves a strong impression on his students.

As for me, I am interested by the ways in which we influence decision-making and the processes by which decisions are made. That does not mean looking for the "best possible decision" and imposing it, but rather more modestly ensuring that decisions are better thought through, reasoned, and consistent with goals, especially in the case of conflicting criteria which necessitate arbitration. Our ways of thinking are fairly close, and we have moved in similar directions from time to time. I have often been stimulated

¹ Magazine for the homeless and unemployed.

by the works of Claude Riveline and the CGS and the CRG, and I am very happy to have once again the opportunity to discuss and debate with him.

II. PRESENTATION

I have been interested in Management for more than thirty years, both from the point of view of teaching and research, and I will try to highlight the route I have followed and its principal stages.

The title of this paper could lead to confusion. Although Maurice Allais was the 1988 Noble Prize Winner in Economics, and Emile Durkheim the true founder of Sociology in France at the end of the 19th Century, my path did not lead from Economics to Sociology. The Durkheim I am talking about here is the author of the totemic cults of the Australian aborigines². This does not mean that I will turn my back on economic rationality because of a preference for exoticism; I always insist that my students have a good grasp of economic calculus, as expounded in France by Maurice Allais. I'll come back to this point later.

But before going further into my subject, it might be useful to explain "where I'm coming from" as they say. My job is to teach Management to engineers, and the significance of this needs to be clarified.

Engineers are not intellectuals by definition. Their world is that of workers, factories and machines. They ask themselves: "How does it work?" "Why isn't it working?" "What can I do?" Theories and ideas interest them in as much as they can be used as tools more than for their elegance or their validity.

By Management I mean the activity that consists of formulating judgements and choices within companies, an activity that is characterised by the lack of available tools for doing so. In the face of the abundance of facts and differences of opinion, the manager, pressured by time, is reduced to using synthetic indicators, short-cuts to truth and usefulness.

Books are not of much use to teach this. Firstly, because the way organisations are run is not widely known as they are difficult to observe, both from the outside and the inside. Secondly, because what you learn about organisation from books is not the best preparation for working in a company. Beginners find themselves assailed with feelings and impressions that are hard to analyse, let alone link to theories.

I chose therefore to teach management by getting the students involved in real problems in real companies, my role being to select the location and to maintain a close dialogue with them in order to help them analyse the difficulties they might encounter.

This work led to various publications dealing with all kinds of different companies in industry, in trade and in the service industry. In order to answer in a more detailed fashion the question of "where I am coming from", I would say that my work is based on several hundreds of studies describing real-life experiences. I will give some examples later on.

² Emile Durkheim. Les formes élémentaires de la vie religieuse. PUF 1985

I would summarise the progress of my approach in the following way: optimisation, local logic, the trinity of manufacturer, seller, financier; urgency, vigilance, and lastly, tribes.

I. Economic Optimisation

When I graduated in 1958 from Polytechnique, Jacques Lesourne's first book³ had just been published. I read it with much enthusiasm, along with most of my class-mates. The book claimed that companies could be run by mathematics, along the same formalised lines as mechanical rationality, with profit maximisation taking the role of minimisation of energy. Professor Allais's classes at the Mines the following year convinced me this was the right way to go, and thus within a short length of time I found myself teaching, not management at first, but Mine exploitation. An exceptionally successful study⁴ encouraged my forays into the field of Applied Economics. I would like to give some details of that first study, as I shall be coming back to it at the end to show how I would interpret it today.

The problem put before us was the following: designing a network of underground mining tunnels boils down to linking the mine shaft to a certain number of loading points where the fallen mineral (coal in this case) is accumulated. How does one choose the most economical network?

The pupils started by asking themselves what the shortest network would be, from the point of view of digging, to link a point P (the shaft) to two loading points A and B. The answer is provided by Steiner's Theorem, which states that the network passes through a point M which is at a 120° angle from the three sides of the triangle (figure a). Note that this is the equilibrium of three lines stretched by equal forces.

However one can easily see that it is not the most economical network, since the shortest network, in terms of not only digging, but also transport, is the network shown by dotted lines (figure a), which links the two points directly to the shaft. As the network shows the two aspects of digging and transport, it is necessary to take both into account at the same time. It can be shown that the optimal network is produced by adding to the force acting on the line MP a supplement which accounts for its greater transport "weight": this is the key discovery.

This led to the invention of the network-optimising machine. This is a table upon which a map of the mine is fixed, along with the holes bored in the shaft and the loading points. The optimal network is determined simply by the equilibrium point of a series of wires, linked by small rings and stretched by known weights !

A prestigious finish to an academic project was that this instrument was declared obligatory in the Charbonnages. It should be pointed out that this problem cannot really be tackled by computer.

2. Local Logic

Encouraged by this success amongst others, I and my colleagues from the Centre de Gestion Scientifique committed ourselves to work in other areas, still from the angle of

³ J. Lesourne. *Technique économique et gestion industrielle*. Dunod 1958

⁴ J. Boisset, JC Moisson, Y. Morel, JM Schauvliège. "Recherche du meilleur réseau de galeries par analogie mécanique". *Revue de l'Industrie Minérale*. Septembre 1967.

profit maximisation or the reduction of a cost to its minimum. However, over the years, this hypothesis on the global logic of organisations has become less and less acceptable. Three revealing examples serve to show why.

“The wrong tonnes before the right ones” : mining centres were closed, with excellent resources left at the coal face while poor quality resources were exploited up to the last tonne. The study revealed that this was due to the daily production scale, which the miners were encouraged to stabilise; in order to do so, they rather dubiously mined all the poor resources first, necessarily coming to the good resources last, thus hastening the closure of the mining centre through deficit⁵.

“New boats before the old” : one can observe that, on one regular cargo line, the commercial agents were ordered to aggressively promote the newer vessels, even though it might have meant that clients would be made to wait and the most impatient would be discouraged. We were able to show that this poor business practice was due to the company's concern for being able to present their banks with a reassuring and favourable image of the new boats operating account⁶.

“The thick sheets before the thin” : a workshop for the cold lamination of special steel sheets was the object of recriminations by the company's sales department, since the former failed to abide by the set delivery dates. The study showed that the workshop delivered as many orders late as it did early, but curiously, it tended to deliver the thick sheets in advance and the thin sheets late. An explanation for this was found in the laminating managers' concern for respecting their monthly tonnage goals. When, around the 20th of each month, they considered themselves to be behind schedule, they would produce thick sheets, and if this production run was started before the agreed date, a delay with the light sheets would result. The latter would be started the following month, with complaints from the sellers, who would thus also be running behind with tonnage, and so on⁷.

In each of these examples, we see dedicated and intelligent managers making choices which clearly go against profit goals. This is due to the fact that each manager optimises the criteria by which he feels he will be assessed.

Hence the idea of modifying the criteria. Attempts at such reforms generally come up against resistance which is difficult to surmount. In the case of the mine, it would undoubtedly have been desirable to measure production, for example once a month; however, the problem is that measurement is automatic, the figures are known to all, and the Charbonnages' administrative supervisors would frequently consult the managers on their activities. It was not plausible for us to react to such problems by explaining that the daily figure was unknown since "the researchers from the Ecole des Mines have explained to us that the less we know, the better we will manage".

However, this implausible formula has some foundation when the decision makers modify their choices according to the manner in which they feel they are assessed. It is as though the measurement itself significantly modifies the thing being measured.

⁵ C. Riveline. "Evaluation des Coûts". *Annales des Mines*. Juin 1973.

⁶ F. Engel et D. Fixari. *Perspectives d'application de la gestion scientifique à la marine marchande*. Publication Ecole des Mines. 1971.

⁷ A. Hatchuel et H. Molet. *Outils de gestion et logiques de production*. Publication Ecole des Mines. 1983.

Such a phenomenon does not exist in classical mechanics, the model for all rational procedures, but it certainly exists in quantum mechanics: picking out one particle presupposes that one disturbs it significantly.

This effect of controls on behaviour leads to an undermining of managers' freedom of choice, to the point that one can talk of management automation, mechanisms which elude the wishes and even the consciousness of those concerned⁸.

Perhaps this is where we find a definition of the devil. Faced with the choices made by honest, intelligent and competent people, whose results are unanimously condemned, the average mind likes to witness the hand of a strong and malefic being.

3. The manufacturer, the seller and the financier.

Among the economic factors shaped in this way by the parameters of judgement, three figures are typically found in various forms in all organisations, and their continual confrontations constitute business life.

The manufacturer, judged on his cost price, favours the efficient use of his machines and personnel; hence the emphasis on regularity, product continuity and flows.

By contrast, the trader, judged on his sales, must seduce the demanding and frivolous customer, and he will wish to switch products frequently, in order to keep up with demand more effectively.

The confrontation of these two figures in the same company is chronic: the question, in effect, is to know whether the former has to continually find ways to produce what the latter wishes to sell, or whether to the contrary, it is the latter who has to resign himself to selling what the former best knows how to produce.

A third protagonist, the financier, observes these disputes with concern. His occupation, on the whole, consists of finding the money from outside the company to pay for the manufacturer's investments, in the hope that the seller's activities will allow the debts to be repaid. It is clear that each actor in these dramas would seem wise to tell a few lies in order to protect his or her own interests.

Could it be that the profit maximisation principle so dear to classic economists constitutes the peacemaking compromise ? For this, one would need to be able to state without ambiguity exactly what profit is, and one can show that the three protagonists each have a different vision of this. We experienced this the day when one shipping company consulted about which portion of their annual profit should be put aside to maintain private assets. The seagoing personnel wanted to preserve the same number of ships, the sellers wished to preserve their market shares, and the financiers wanted to keep to the same ratios of borrowed capital ; the three figures were very different, but none was more "true" than the others.

These confrontations do not belong merely to industrial and commercial companies. Within ministries or town councils, civil servants and politicians reproduce the conflict of interests between manufacturers and salesman ; the same occurs in hospitals between the

⁸ Cf. M. Berry. *Une technologie invisible ?* Publication Ecole polytechnique. 1983.

administrative personnel and the medical staff. Moreover, in each case a financier keeps an eye out for trouble.

It is thanks to this trilogy inspiring me that I chose the three studies summarised below : the case of the mine reveals the conflict between the manufacturer, who saturates the pit, and the financier, concerned about the deficit ; in the case of the boat company, there is a conflict between the financier, worried about the accounts looking good, and the salesman who wants to make deals as quickly as possible ; finally, in the laminating case, conflict is seen between the manufacturer, who works his machines to maximum capacity and the salesman paying attention to deadlines.

It is this latter confrontation that we come across most frequently in our engineering work, since the world of finance is more discreet. This gives an account of the growing role of urgency which I will now mention.

4. Urgency

The power relationship between the conflicting manufacturer and salesman has in effect been steadily evolving for several decades in favour of the salesman. Indeed, changes of all kinds have been accelerated by the contribution of every factor : the communication of information, the movement of goods and people, technical innovation and worldwide competition. Three examples of characteristic industries are automobiles, electronics and textiles.

Only twenty years ago, the shortest possible time from the design of a new car to its launching on the market was considered to be six years. Today, the length of time one hears mentioned is about half this.

In electronics, performance growth and the lowering of costs is so rapid that delaying a decision by one month could result in a 15 % loss, all things being equal.

In the textile industry, one can quote reductions in production times from one year to five weeks, or from several weeks to 48 hours.

This has profound implications on work methods : the shrinking of hierarchies, matrix structures, free-form work⁹, new relationships between thought and action¹⁰, tight-flow distribution, and so on. It has never been more true to say that time is money, to the point where the most costly thing today is neither capital, nor labour, nor supplies, as in classic economics, but breakdowns, whether they are due to machine failure or a lack of clients. In fact, foreseeing breakdowns is a matter of vigilance, an ingredient of economic activity unknown to classic economic text books.

⁹ Ch. Midler. *L'auto qui n'existait pas*. Interéditions 1993.

¹⁰ P. Bonarelli. *La réflexion est-elle rentable ?* L'Harmattan. 1994.

5. Vigilance

Remarking that Marxist economists place the appearance of value in relation to work, and liberal economists in relation to needs, Jean-Marc Oury¹¹ observes that value only appears when the agent conveying a particular good makes contact with the receiver, and this is by no means automatic, contrary to what the vague concept of "market" would suggest. In order for a market to function, it is necessary for people who are ever alert (this is the latin etymology of the word vigilance) to take advantage as quickly as possible of any opportunities for profit that may arise.

There is an element of shock in the fact that intermediaries earn as much money as those who directly transform the raw materials without as much apparent effort, and yet their function is no less important. Many markets exhibit numerous agents who negotiate considerable sums of money by telephone and who win and lose fortunes in seconds; yet such agents are neither frivolous casino gamblers nor dangerous speculators, but professionals responsible for turning the essential cogs of economic life, who allow those responsible for transforming the materials to confidently know the prices of their purchases and sales at a given date. This is the case with markets such as financial products, foreign exchange, freight shipments, oil products, and so on. In all these occupations, the sellers constantly keep up to date with prices and any information which is likely to modify them, and all this occurs under the stress which goes with the job.

It is in this way that in January 1991, during the negotiations which preceded the Gulf War, the Iraqi Tarek Aziz and the American James Baker had a tête-à-tête lasting several hours. All the players in the oil market had their eyes glued to their screens and to CNN television. At the end of the interview, Baker told journalists : "We have closely examined the whole issue. However,..." Before he had finished pronouncing his weary "however", prices soared and within two minutes they had risen by 3 dollars a barrel. It should be noted that even in the course of an unstable day, the fluctuations do not normally go beyond 20 cents.

The seller's art is based entirely on vigilance. This attitude plays a central role in every situation where urgency is all and information is perishable. Indeed, no one can keep an eye on everything all at once. It is often indispensable to share this task with others, which suggests the idea of networks.

6. Networks¹²

A textile manufacturer once explained to me : "there are two major businesses in my field : fabric and clothes. In the first, enormous machines are needed, in the second, a good supply of staff. This makes product changes both difficult and costly. In order to jump on the demand, as is necessary nowadays, it is much more effective to do no more in-house than is strictly necessary and to contract out the rest, since we have more control over our suppliers than over our own employees. In this way Luciano Benetton announced to the journal *Usine Nouvelle* in January 1994 that he directly employed only 5,000 people, but gave work to 450 small businesses, totalling 25,000 workers. There are

¹¹ J.M. Oury. *Economie politique de la vigilance*. Calman Lévy. 1983.

¹² Ch. Barbant et Ph. Chanut. "Les réseaux créateurs de richesses". *Annales des Mines. Série Gérer et Comprendre*. Juin 1989.

even some professions where the boss is a sort of orchestra conductor, an assembler without any industry of his own, to the extent that one talks about the “virtual firm”, a meeting point of various agents working on a single, futureless production run.

Even some large integrated companies take advantage of their belonging to several networks. Hence the president of Total group announced to an auditorium of student engineers : “My company practices three businesses : drilling-production, refining and distribution. But you would be wrong thinking that I refine the oil that I produce, or that I sell the products of my own refineries. At each interface there is intense trading, which if successful, can be extremely profitable. “Why,” then asks a member of the audience, “do you keep on managing heavy plants ?” The answer : “Apart from the concern for the perennality of a prestigious, long-running company, this arrangement gives sellers the advantage of being fed information on new techniques and offers them access to capital funds in the case of a bear market or a recession.”

This last remark indicates the limits of sub-contracting and the decentralisation of activities, which have both been showing a certain decline in the last few years. However, even when an industry has control over a variety of activities, the forms of relationships induced by urgency within the company, as mentioned above, suggest more the idea of networks than organisation charts or pyramid hierarchies.

7. Tribes, rites and myths

This omnipresence of networks begs the question of in which conditions they work well. In order to present the problem as I see it, I will compare two styles of negotiation which I will call the “Chinese way” and the “American way” respectively.

An example of the former might be in the following telephone conversation : “OK to continue like last month, less ten percent? What do you mean “less six” ? At that amount it's not worth my while! How about less eight? Fine. See you soon.”

One imagines that this conversation lasted one or two minutes.

The classic American businessman tends to express himself in the following way: “Would you agree to my lawyers meeting yours to settle the details of our collaboration in this matter ? That’s fine ! “ Several weeks later a voluminous contract is solemnly signed, anticipating every eventuality between the two parties.

It is clear that the Chinese conversation implies a degree of complicity between the two speakers which makes the writing of a legal document unnecessary. It is this way between close relations, best friends and long-term lovers.

However, similar ties can be observed between people who have never met, as in financial markets, mentioned above in connection with vigilance. Why do they place so much trust in the spoken word, especially on the telephone? I'd like to suggest that they feel they belong to the same tribe.

The word tribe can surprise and even shock some people, but experience has shown that it seems to give the most accurate description of the professionals concerned. The latter confirms that one does indeed identify a possible partner in a network by ways of acting and speaking, as well as through having access to certain places and dialogues.

By trying to use the word tribe in several contexts, I was reprimanded by my ethnologist friends, who recommended the works of several authors for me to read to ensure that I would not use the term inappropriately.

In particular, I benefited from the advice of one multi-talented and prematurely disappeared researcher, Denis Guigo, who was a pioneer of the approach to modern organisations using studies usually carried out on exotic tribes¹³. It was in this way that I came to a page of Emile Durkheim¹⁴ which stated that a church is only perpetuated if it is supported by prescribed behaviour, rites, shared ideas and myths. There is only a short jump between the concept of a church, from the Greek *ekklésia*, assembly, and that of the tribe, and I tested the hypothesis that what works in networks is the trilogy rites, myths and tribes.

This hypothesis seemed to me to be promising, for example for explaining failures. If one of the three elements comes to be missing, the other two will soon collapse. For example, a few years ago the industrial world experienced a trend in “quality circles”. There are few remaining traces of this today. It was a rite, consisting of getting teams to meet together after work to study ways of making progress. It seems highly likely that these meetings were abandoned due to the lack of a shared myth.

One also sees company chiefs trying to breathe fresh enthusiasm into their colleagues through a “company project” or a “charter of values”. But if, during the period in which they want to create such a myth, the circumstances oblige them to shed workers, the tribe disbands; the feeling is lost even among the members who are staying with the company, since they fear that they will be the next victims.

This trilogy of rites-myths-tribes sheds some light on the differences in business practices between countries, from the minute that they are identified with rites. For example, French balance sheets are drawn up annually, whereas they are published every three months in the US. It is not unreasonable to blame this on France’s agricultural tradition and the rhythm of the seasons on one hand, and on the shipping tradition of the Anglo-Saxon world and the average length of a commercial crossing on the other hand. This hypothesis is supported by the fact that in France the top of the balance sheet is occupied by landed property and in the USA by liquid assets.

So I have now arrived at a stage in my research where I am postulating that organisations function uniquely via ritualised activities; they survive only if they can provide signs of complicity for the members of their tribe, who renew their membership because they share convictions of a mythical nature, a term which does not indicate something false, but something in which one believes.

So we have now arrived at a point far from the mathematical reasoning I started with.

8. Reason anyway

Let’s return to the optimisation of the mining tunnel network, an apparently clear application of economic calculation. Not so. As intuitive as the addition of digging and

¹³ D. Guigo. *Vivre dans les organisations modernes. Ethnologie des hommes, des usines et des bureaux*. Thèse de doctorat de l’Ecole polytechnique. 1991.

¹⁴ op. cit. p 60.

transport costs may be, it is a theoretical observation which does not correspond to any observable reality. The digging is in fact an investment, determined by an annual procedure which involves the company's most senior decision-makers and its supervisors. The end figure is the result of strategic and financial arbitration which never completely satisfies the estimated needs. If the margin is favourable, the network to be used is the shortest in terms of transport, since it is unreasonable not to use all the available credit. In the opposite case, the favoured network is the shortest on the map, since this economises facility credits. Certainly, transport will be more expensive here than in the "optimal" network, but these transport costs contribute to the current digging expenses; they are not singled out, and they become lost in the decimals of the total cost price. Taking account of this at the time of digging would amount to cutting off other investments for the sake of a future economy that no one can ever foresee.

However troubling this conclusion may be, economic rationality seems here to be a myth and the calculations it inspires a rite. Our problem with this observation without doubt comes from the nobility of this myth, from its origins in the age of the Enlightenment and from the humanism it espouses. The corresponding tribe is of spirits formed by the use of formalised reason, which is the case of my students at the Ecole des Mines. This explains why still today I ask them to master the 1958 lessons of Jacques Lesourne. Selected through competitive entrance examinations where the pure sciences play a major role, they instinctively make use of the corresponding mental mechanisms when faced with any suitable problem. This is true of elementary economic choices, but my pupils would even reinvent the models of Waldras and Pareto if they had the time and the talent to do so. As this has already been done with vigour before their time, it would be as well to avoid errors of logic. Surprisingly, the vocabulary of economic life is full of terms taken from these theories (return on investment, marginal cost, etc.) of which the exact meaning and use limitations must be known. But for making them measure the effects of these proceedings on real life, I have not found any other method than associating them with a real-life adventure.

To conclude, I would say that my initial mechanical outline suffers from two flaws : it accounts for neither the subjectivity of costs and profits, nor urgency. The first omission masks the irremediable diversity of men and their interests, while the second masks the simplifications which mechanise their attitudes and behaviour.

If I had to define in a few words management research as I see it today, I would say that its goal is to throw light on the intrigues of the Devil in the sense indicated above, and it is said that the Devil hates the light.

NB : This text essentially summarises three articles published in the Gérer et Comprendre series from the Annales des Mines.

De l'urgence en gestion. Mars 1991

Un point de vue d'ingénieur sur la gestion des organisations. Décembre 1991

La gestion et les rites. Décembre 1993.

III. DEBATE

You said optimise ?

B Roy (BR) : One central point in your writings that you haven't referred to this evening, is that agents establish their choice in a logical manner by optimising the criteria by which they feel they are assessed. Thus there is no global optimisation, rather a local one. Indeed, save the three examples given at the beginning, the agents that you presented

today are strongly driven by the maximisation of some element, and you say that the traders are not assessed. Have you abandoned local optimisation ?

C. Riveline (CR) : I think that profit maximisation is a misleading expression for designating the driving force of companies. For my own understanding, I'll sum you up a conversation I had a few years ago with a textile industrialist, a Polytechnique graduate of my age.

Him : " I have nothing to do with intellectuals like you who study company chiefs as if they were studying insects. I have only one goal : profit ! "

Me : " What is it ? Dividends ? Net profits ? Annual cash flow ? In the latter case, I'll suggest something radical to you : sell your factory, since land is worth a lot of money. "

Him : "And what would I do in the future ? I care about the perennality of my company, and my problem is that I am confronted with fearsome competition from Taiwanese manufacturers. "

Me : "Then do like your colleagues and go and set up operations in Taiwan."

Him : "But my life is here..."

Me : "Your profit maximisation seems to me to be very complicated."

Him (change of mood) : "But at the end of the day, if I stop making a profit, my company will die !"

Me : "So profit is the name you give to the fear of dying. But I will show you that it is the thing in common to all living creatures, and it is hardly a discriminating principle for action."

As for the traders, it is true that they are not assessed formally, but one may assume that their local optimum is made up of confidence and the quality of their network; however, I agree with you that there is a lack of observations on this particular subject.

BR : According to your theory, the agents optimise, which implies several possibilities in exclusive pairs of choices (exclusive, otherwise one cannot optimise). Indeed, there are numerous cases where the possibilities are not exclusive. It is also necessary to define the set of possible choices ; if these are ambiguous, there is no sense in optimising ; indeed, this is often the case. Finally, don't these agents have the impression of being judged in several tribes by conflicting assessment criteria ?

CR : As I'm listening to you I'm thinking of your work on multi-criteria choices, and I would like to say that my economic agent, practically robotised by the assessments hanging over him, is no more than a convenient model, since every agent is subject to other imperatives peculiar to him, which are accounted for in your approaches, but not mine. This is perhaps how freedom can be characterised, and I don't have a theory on this.

Change

BR : In your theory it is difficult to see how change is created, since the actors conform to the rules. Indeed, they also make the rules evolve and I do not see where in your theory that places them.

CR : Here you're posing the problem of change processes, and I make the distinction between changed that are endured and those that are desired. In the former case, an evaluation of the outside world obliges the agents to adapt and one can surmise that in doing so they keep the same logic for as long as this remains possible. On the other hand, this does not explain desired change. I'm in the habit of saying that such changes result from the meeting of upheavals and long sufferings. Thus, in the first few months following the storming of the Bastille, the members of the Constituent Assembly set up the structures that are fundamental to the France of today. But in order to do this, they drew on fifty years of thought by the philosophers of the Enlightenment.

BR : Is the Constituent Assembly applicable to what happens in a company ? Isn't voluntarism prepared only at length ?

CR : I notice that the desire for change in companies clashes most often, through a lack of preparation, with one of four elements : materials, people, institutions and cultural norms. For example, sophisticated machines are installed, but the personnel are not trained sufficiently in their use ; a new pay scale is introduced and there are riots, since the implicit hierarchies are ridiculed, etc. My analyses have no prescriptive capacity ; rather, they are ways of questioning and aide-mémoires.

Michel Crozier : In your theories the world seems stable, very much like in our myths. But nowadays we have to change and voluntarism's place is much greater. And this is not the French Revolution, since we often have to change without being well-prepared. You tell us that we have still forgotten something. This may be, but more should be said about it. Certain aspects that you have criticised, such as urgency or limited rationality, could well be used, if they are not allowed to dominate. The viewpoint of ethnography or the most stable social sciences needs the light shed by sociology dealing with voluntarism and games, which is much less stable.

CR : I cannot argue with you, and your work in this field provides insights which have been very useful to me. My question is above all : what is effective ? On this account, in the rite-myth-tribe triangle, I have no doubts at all that the essential lever is the rite, since it can be both highly visible and sufficiently ambiguous for everyone to benefit from it. For example, after the merger of two companies with different culture, I would suggest to the boss that, instead of laboriously drawing up a "Charter of Common Values", he should organise a wild party to baptise the newly born child of the common switchboard operator.

Speaker: What do the Japanese inspire in you, given that they do not at all have our model of rationality ?

CR : The Japanese do not, in fact, reason according to our norms. The logical constructions inspired by Maurice Allais are foreign to them, but they are described excellently by the tribal models of Emile Durkheim.

Tribes

Contributor : Is a tribe an innovative form of corporatism, often considered as an element of sclerosis in the French company ?

CR : A tribe, as I take it to mean, can be the best or the worst thing. You are emphasising the conservative aspect, and with reason. However, the solidarity which unites its members can be used to serve the collective interest. I experienced this in the course of my year in the civil service in Algeria before its independence. Two senior officials, both flanked by a young Mines graduate engineer, exchanged correspondence on an important current event. The normal procedure for such an exchange involved several hierarchical levels of the two administrative bodies concerned. In this case, the matter was settled by a telephone conversation between the two engineers, who together drafted the question and the reply. The result was in the end the same as if it been reached through the laborious usual procedure, but in doing so several weeks' time was saved.

Yves Dubreil : In the same tribe there are occupations, and this is what differentiates it from corporatism.

CR : As head of the Twingo project, you are particularly well qualified to say that, since you have succeeded brilliantly in getting completely opposing corporations to cooperate.

Christian Schmitt : Do the transformations in norms demand a change of tribe ? As each individual belongs to several tribes, isn't there one which becomes dominant ?

CR : I believe it is necessary to distinguish between norms and myths. Norms impose themselves by an invisible authority, whereas myths derive their strength from people's spontaneous support. The current debate on the SMIC-jeunes (minimum wage for young people) shows the distance which separates the real starting salary from its cultural acceptance. As far as concerns belonging to several tribes, this seems to me to be an essential measure for safeguarding individuals' sense of balance, since it carefully handles various sources of self-actualisation and means of compensation.

Eric Godelier : What is the next stage ? Are you going to bury management underneath the rite or will you make a church out of it ?

CR : Contrary to philosophers, I do not attach great value to ideas and terms of speech. As I said in the beginning, I consider myself a modest craftsman who pieces together social machinery with the tools of the day. I haven't really thought about tomorrow's tools.

Sources of decisions' legitimacy

BR : Some think that it is only possible to root the legitimacy of a decision by the process which stops it. What do you think of this ?

CR : You are emphasising a fundamental problem. The procedures for choice elaboration play a considerable role, often more decisive than the preferences of the decision makers concerned. These are what give every importance to constitutional law and are concerned with the way in which laws are made. Consider Switzerland. Here is a country which has all the characteristics of the other Central European countries, which have been

characterised for centuries by a history of blood and tears. Indeed, Switzerland, with its geographical, ethnic and linguistic contrasts amongst others, has lived in peace since 1516 and offers an ideal image of harmony. The secret of course lies in its institutions, but it remains to be clarified which of these are workable elsewhere.