The Transition to Labour Management as a Gestalt Switch

by Ekkehart Schlicht

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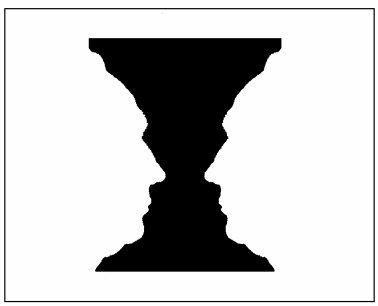

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The Transition to Labour Management as a Gestalt Switch*

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Mit 8 Abbildungen

Introduction and Summary

This essay contains a highly speculative theory of social change together with an application to the theory of labour management. It draws on previous work done by the author (1972, 1978), partly in collaboration with *C.C. v. Weizsäcker* (*Weizsäcker/Schlicht* 1979).

In Part 1 the proposed theory of social change is developed in some detail. The argument leads to the conclusion that society interprets its rules of social organization and interaction as modifications of pure, or simple, or prototype rules, rather than viewing the prevailing set of rules as a self-sufficient archetype. This leads to the proposition that continuous social changes might entail discontinuous switches in the scheme of social organization. Since the theory draws heavily on Gestalt psychology, these switches are termed Gestalt switches: discontinuous changes in superstructure brought about by smooth changes within the existing socio-economic framework.

Part 2 deals with an application of this general kind of argument to the theory of labour management. Starting with a sketch of why labour immobility is a precondition for the viability of labour management in a competitive economy, it will be argued that technical progress will lead, through competitive pressure, to just that: a de-facto-immobility of labour. Thereby, the stage is set for the development of an efficient type of labour-managed organization which might evolve from competition; but immobility of labour will have another important consequence: The very notion of the firm will undergo a change, socially. People will cease to interpret employment relations as exchange relations. Rather, they will view the employment contract as establishing permanent rights and obligations. Since workers are tied permanently to a firm, firms will be considered as being *constituted* by their staff rather than by changing physicalequipment, just in the same way as a firm is viewed socially as being constituted by the owners of capital under capitalist conditions. Thus, firms will become ultimately identified with their staff rather than with the suppliers of capital, and the labour managed firm will appear as the "natural" form of organization. Actual firms will be considered as modifications of this pure form just in the same way as co-determination is considered as a modification of the pure capitalist mode of organization today.

Thus, this precarious kind of theorizing leads to the conclusion that strong pressures are working towards a gestalt switch to labour management. The reader is kindly requested, however, not to take those conclusions at face value, since the foundations on which the theory is built are not excelling in firmness. Take all this, please, as a Gedankenexperiment, as one particular attempt towards a better understanding of social and economic change containing, perhaps, some elements of a fruitful approach.

1. Psychology of Social Change

In this part of the essay, the notions of a social scheme and of communicative stability will be developed, and it will be argued that the transition from one communicatively

An earlier version of this paper has been presented at the meeting of the "Society for Gestalt Theory and its Applications (GTA)" in Darmstadt (West Germany) April 1979 and at the "Interlaken Seminar on Analysis and Ideology" in Interlaken (Switzerland) June 1979.

stable social scheme to another one has appropriately to be viewed as a discontinuous shift (as a gestalt switch) rather than as a continuous process for reasons derived from the gestaltist theory of mental organization.

1.1. The Law of Prägnanz

If a brain is required to store the trapezium of figure 1 in the memory, it seems to be optimal to not store it as one particular figure but rather as a modification of a standard figure, i.e. a triangle with a dissected peak (fig. 2). Call this standard figure the *scheme* belonging to the trapezium*.

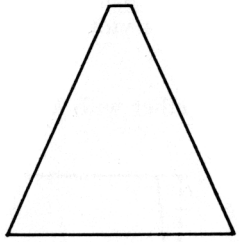


Fig. 1

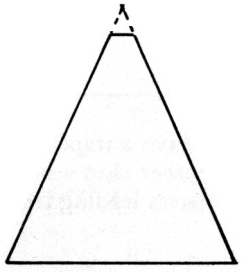


Fig. 2

Quite generally it seems to be principle of perception to be organized in such a way that complex phenomena are interpreted in terms as simple and as constant as

The notion of a "scheme" has been used frequently in this connection, e.g. by *Bartlett*, p. 199. The theoretical development of that notion is, of course, due to Piaget, see e.g. Piaget p. 22–24. It is very closely related to the Kuhnian "paradigm". As used here, it differs from Bartlett's notion insofar as it is considered to be less plastic – in fact, its rigidity will be essential for the following argument.
Earlier writers have used the term „Bezugssystem" ("system of reference", see *Witte*, 1966, and *Witte*, 1960, in this connection). The term "cognitive reference point", as used by Rosch recently, seems to be slightly misleading and has not been adopted here. Although this problem is as old as Gestalt psychology, it seems to have been somewhat neclected for a long time – hence the terminological problem. The study by *Rosch*, however, provides references together with some new evidence for the structuring of perception as described above, i.e. that "many natural categories are internally structured into a prototype (clearest cases, best examples) of the category with nonprototype members tending towards an order from better to poorer examples. [*Rosch*'s] study provides further evidence that not all members of a category are equivalent and it adds information concerning the relation between the prototype and non-prototype category members, namely that the best examples of a category can serve as reference points in relation to which other category members are judged" (*Rosch*, pp. 544–5).

possible. This tendency constitutes the cornerstone of Gestalt Psychology and is called the *law of prägnanz**.

The theoretical foundation of the law of prägnanz is held to lie on the optimization of our nervous system brought forth by natural selection; on this rather abstract theoretical level, prägnanz denotes simply an optimal — and hence stable — state of nervous organization (perceptive and intellectual).

The experimental evidence for the law of prägnanz, as well as an elaboration of the notion of prägnanz in more operational terms, is overwhelming with regard to perception, and is considerable in other fields of psychology. As the following remarks are mainly concerned with perceptive phenomena it might be permitted in the following to take the gestaltist view of mental organization for granted.

1.2. A Gestalt Switch

Consider another figure together with its scheme (fig. 3).

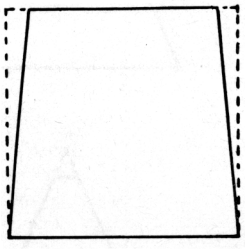
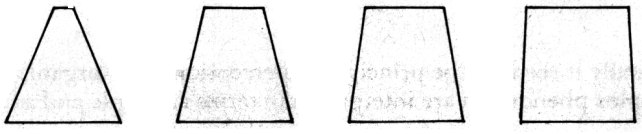


Fig. 3

As in the previous case we have a trapezium but this time, it is organized perceptually as modified square rather than a modified triangle.

Now consider a gradual process leading from figure 1 to figure 3 together with its scheme (fig. 4).

figure



scheme

Fig. 4

Somewhere in this sequence, the scheme will switch from triangle to square. This phenomenon is called a *Gestalt Switch.*

* For an introduction, see *Manis*; see furthermore the books by *Köhler* (1947), *Koffka* (1935), *Metzger* (1975a) and *Piaget*. On the notion of Prägnanz in visual perception, see *Metzger* (1975b), pp. 218–228.

1.3. The Discrete Character of Prägnant Forms of Organization

It is now to be noted that this gestalt switch is of a *discrete* character although the figure underlying the scheme has been changed in a smooth manner.

The theoretical explanation for this rests on the fact that optimal information storage and processing requires a hierarchical structure. Think of the different levels of abstraction involved in the sequence shepherd-dog-mammal-animal, and the effectiveness which can be gained by abstract reasoning in contrast to clinging to unessential particularities, without doing some grouping; or think of the comparative ease of retrival of particular items if these items are grouped according to some principles rather than filed in a randomizing caprice[1].

Here the grouping principles level above the particular notions in the cognitive hierarchy.

Suppose now that the items to be memorized are undergoing a change. At first, this will not affect the grouping principles, the new knowledge will be *assimilated* into the previous cognitive scheme. But as augmentation continues, the set of grouping principles might become inefficient with respect to this new state of information, as compared to another scheme. If this comparative inefficiency becomes strong enough, the more efficient organizational mode will be adopted: The cognitive scheme will switch to a superior pattern, it will *accomodate*[2]. Hence the gestalt switch.

In order that the distinction between assimilation and accomodation, (between the intergration of new elements into a given scheme and the gestalt switch to a new scheme) be relevant, it has to be assumed, however, that there be no continuum of schemes: If optimal patterns of organization were closely adjacent to each other, gestalt switches would become more or less continuous thus ceasing to be switches.

It will be *assumed* in the following that this is not the case, i.e. that discontinuous gestalt switches are characteristic traits of mental organization. This assumption seems to be reasonable in view of the empirical evidence with regard to various perceptive phenomena. Furthermore we know from information theory that hierarchical systems are quite rigid and cannot be changed smoothly[3]. In fact, it seems rather difficult to imagine continuous changes in mental structure. The apparent lack of theoretical analysis of the discontinuity of cognitive schemes seems to be largely due to the fact that neither the gestaltists, nor Piaget have taken notice of this fundamental problem just for that reason[4].

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[1] See Appendix C on hierarchical information storage below, which illustrates this point. For evidence on the thesis of the hierarchical character of mental organization, see *Palmer* and *Thorndyke*, for instance.

[2] This is, in brief, the view which has been taken by *Piaget* with regard to learning phenomena, and the notions of assimilation and accomodation, as used above, are his, see e.g. *Piaget*, p. 243. But note that *Piaget* has been concerned mainly with *irreversible* learning phenomena whereas the present discussion deals with *reversible* accomodation processes, which are termed "gestalt switches" in order to avoid confusion.

[3] With regard to information systems, *Meadow* has observed: "In summary, hierarchical languages are rigid in the sense of being hard to change except by expansion at the bottom", and gives a nice illustration for this fact, see *Meadow*, p. 27.

[4] *Levi-Strauss* (1962), p. 181, being aware of this problem, draws an analogy between the discontinuity of notions and the discontinuity of species which is probably not very well taken since the latter relates to the necessity of sexual procreation to which I do not see any analogy in the present context. *Piaget*, on the other hand, simply restates what the early gestaltist have tried to demonstrate experimentally, i.e. that the principles of mental organization tend to be constant and have to be invariant to a certain extend in order to assure a proper functioning of the mind, see *Piaget*, p. 212.

1.4. Prägnant Distortions and Communicative Stability

The information processed, however, does not remain unaffected by the scheme by which it is organized: There is a tendency to distort the information in the direction of increasing prägnanz.

We all know how a story is transformed if it is passed on by word of mouth: The outcome will be a crystallized myth obeying laws so complex as to require a *Levi-Strauss* to lay bare its structure[1].

Experimentally, the repetition of stories „over long time intervals reveals rather striking tendencies toward structuring the story so that it "makes sense", and as the story grows older, it also got shorter and irrelevant details dropped out[2]. More specifically it has been found that "comprehensibility and recall (are) a function of the amount of inherent plot structure in the story, independent of passag-content. Recall probability of individual facts from passages (depend) on the structural centrality of facts: Subjects tended to recall facts corresponding to highe-level-organization story elements rather than lower level details. In addition, story summarizations from memory tended to emphasize general structural characteristics rather than specific content[3].

In somewhat more general terms, and using *Wulf*'s terminology, successive reproductions of a given matter will lead to a tendency either of *levelling* divergencies between matter and scheme, or of *sharpening* these differences such that a terser reproduction is obtained (*Hilgard/Bower*, p. 237; *Wulf*). Thereby, prägnanz will be increased, and subsequent reproductions will exhibit less variability[4]. Finally, a stable outcome will be reached where divergencies from a common pattern will be simply random, thus cancelling each other and giving persistence to the basic shape. We call this a *communicatively stable* configuration[5]. Consider now the set of communicatively stable configurations (assuming it to be non-empty): Since a communicatively stable configuration is defined as being stable with regard to sufficiently small random distortions, two communicatively stable configurations cannot lie too closely together: Communicatively stable configurations will be of a *discrete* character for this reason, too (i.e. in addition to the fact that points of high prägnanz will lie apart).

The particular scheme belonging to a communicatively stable configuration is called a *communicatively stable scheme*. It might be different from the communicatively stable configuration, but these differences will be marked (due to sharpening) and sparse (due to levelling and prägnanz).

[1] See *Lévi-Strauss* (1964–1971) The close ties between (French) Structuralism and Gestaltism have been noted by *Lévi-Strauss* (1958), pp. 353–356.

[2] This is the summary by *Hilgard/Bower*, p. 250 to *Bartlett*'s classical experiments.

[3] *Thorndyke*, p. 77. This study contains further references on the topic.

[4] See *Prinz*, pp. 331, 350 for some evidence on the proposition that prägnanz increases accuracy of reproduction and for additional references.

[5] The emergence of communicatively stable stories can be observed in Bartlett's examples, for instance, see *Bartlett*, pp. 118–176. The essentially stable features emerge after only a few reproductions, and they emerge quite unexpectedly such that "nobody, seeing only the first and the last version, would be inclined to connect them in a continuous series" (*Bartlett*, p. 165). The notion of communicative stability, however, is the authors, who is not a psychologist. The reader is kindly requested to bear this in mind in order to appreciate the very speculative character of the whole argument. What seems to be clearly established by the experiments reported in the literature, however, is that some stories are *more* stable than other stories, some configurations are *more* stabe than other configurations, etc. To quote *Bartlett* again: "in fact,

1.5. The Social Scheme

If perception proceeds as indicated above, what implications for the pattern of social rules can be derived from this kind of argument, and what are the implications for the theory of social change?*

The following considerations will be concerned with one facet of this complex. Reflection will be directed towards the basic principles of social interaction which constitutes what might be called the *social scheme*. The notion is used here in a strictly parallel meaning to the concept of a scheme of perception, as introduced earlier, i.e. as the highly idealized (and highly prägnant) „prototype" representation of the rules of social interaction as perceived by the representative individual**.

Furthermore, the rules constituting the social scheme will not necessarily be codified in the law, nor will they belong to the conscious knowledge of society: Typically, these rules will be present in the same unconscious way as the rules of grammar are unconsciously present in any discourse.

1.6. The Perception of the Social World

The theory of perception as outlined previously can now be applied to the perception of the social world: People will interpret social reality in terms of a social scheme which can be considered as an idealized set of rules of particular simplicity and terseness, i.e. with a high degree of prägnanz. The actual social rules can be thought of as diluted examples for this scheme (diluted, for instance, by reminiscenses from past habits).

the overwhelming impression (...) is that human remembering is normally exceedingly subjectto error. It looks as if what is said to be reproduced is, far more generally than is commonly admitted, really a construction, serving to justify whatever impression may have been left by the original. It is this "impression", rarely defined with much exactitude, which *most readily persists*" (*Bartlett*, pp. 175–76) (my emphasis).

* The idea to employ gestaltist arguments to social theory has been pursued for the first time by *Heider* (1944) with some rigour, although his questions were different from those discussed in this essay; see also *Heider* (1958). *Festinger*'s well-known theory of cognitive dissonance pursues the gestaltist approach to social theory in another, albeit related, direction.

** There are several experiments which show that the rôle of experience in perception is not to be overestimated and that the concept of prägnanz is ahistorical (in this sense) to a large extent. For instance, the same configurations are identified as prägnant by human beings as well as by certain birds (see *Köhler*, 1947, pp. 147–149). Furthermore, previous exposure to certain figures does not increase the probability of perceiving them if they are embedded in strongly organized larger configurations, see *Gottschaldt*. To take an example from *Köhler* (p. 194): The following figure „may be described in various ways; but no one would spontaneously mention the letter E in such a description. At the same time, the letter is, of course, geometrically present, and the object which is actually seen is less known than the letter".
While reading this paper, you have been exposed to the letter T for approximately 50 times quite recently, but in all probability figure 5 has not appeared either as an adorned T at first sight. This and similar findings seem to justify the assumption of a sufficiently high degree of unanimity in the perception of the social world and the use of the concept of a representative individual here. If different social classes are exposed to significantly different social environments, however, this might lead to conflicting perceptions of the social world leading to social tension – but this line of argument will not be pursued here.
Personally, the author is convinced that this kind of argument is of no great relevance in the present context since these phenomena will be important only at the switching point, i.e. they will be an indication of transition, but will not contribute much to the understanding of an emerging social scheme which will be common to the overwhelming part of society.

To take an example: An exchange relationship which offers no feasible and equally attractive alternative to one of the parties, and hence is considered as being compelling, will *not* be interpreted as an exchange relationship by this party, but rather as an reciprocity arrangement, i.e. an arrangement comprising rights and obligations. It will not be seen as being subject to discretion of the "compelled" party[1]. This aspect, which is a central feature of the notion of exchange, will be of only secondary importance. In particular, highly asymmetric exchange relationships involving no alternative for one party and many alternatives for the other party will be interpreted as hierarchical (or power-) relationships rather than exchange relationships, since this way of looking at things would grasp the gist of the matter in simpler terms[2]. This holds true quite irrespectively of the particular legal rules

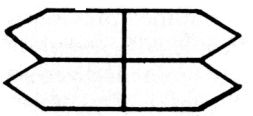

Fig. 5

which serve as the framework for social action; in the case of the example given above, for instance, the legal construction might very well be that of voluntary exchange, but this will be considered as being inappropriate and unjustified, possibly as a "veiling" of the "true" power relationships.

1.7. The Social Tendency towards Prägnanz

The important phenomenon seems to be, therefore, that people tend to *interpret* actual events in terms of the social scheme, and divergencies from this scheme will be judged as being arbritary or, at least, require special vindiction. Thus, the switch of the scheme has direct implications with regard to the *normalive betiefs* held within the society: People will accept arrangements which can easily be interpreted in terms of the social scheme without much urging, but they will require additional reasons for arrangements which are not conforming to the basic principles incorporated in the social scheme, or will resist them[3]. This puts social pressure against any divergencies, and hence a social pressure towards prägnanz.

The second pressure towards prägnanz of social arrangements rests on the communicative distortions discussed earlier: Since the rules of social behaviour

[1] For the notion of reciprocity, see *Polanyi*, pp. 250–256.

[2] It is true, of course, that any reciprocity relationship can be viewed as an implicit exchange relationship, or vice versa: Any exchange relationship can be treated formally as a reciprocity relationship where give and take happen to coincide. The first view has been adopted by the "formalist" school of economic anthropology, as well as by *Alchian* and *Demsetz*, for instance. (See also *Nutzinger*.) The latter view is adopted by those who think of economic relationships as conceiled power relationships. From the "substantivist" perspective adopted in this paper, both extremes seem to be misleading.

[3] This is the basic approach to the theory of ethics taken by *Wertheimer*. See also *Köhler* (1938). The view on the theory of justice taken by *v. Hayek* quite recently seems to be contained in this approach, but *Wertheimer*'s conception seems to be much broader and goes far beyond the Popperian spirit of *Hayek*'s contribution.

have to be communicated (have to be "learned"), there will be a tendency to communicatively stable schemes, hence a pressure towards schemes of particular prägnanz.

1.8. Continuous Social Change and the Switch in Social Schemes

If, for the sake of the argument, all the above is taken to be firmly established, there will result a theory of social development which is very similar to *Piaget*'s learning theory (see section 3 above): Assume some changes to occur within a given social organization, and assume these changes to work themselves out gradually, albeit cumulatively, like population growth, capital accumulation, or technical progress. These changes have to be *assimilated* within the given rules of social organization just as the continuously changing trapezium is considered as a modified triangle at first (see fig. 4). But these assimilations will prove harder and harder until a point is reached where another form of social organization becomes potentially more efficient, and it becomes increasingly simple to envisage the social world in terms of the new scheme rather than in terms of the old.

Finally, people will start to interpret social reality in this more prägnant framework. A social gestalt switch will occur, in consequence, and the character of society (how it views its owns reality, and how it modifies it) will change in an accomodating fashion, just like the scheme belonging to the trapezium switches from triangle to square (fig. 4).

2. The Tendency to Labour Management

The theory of social change, as outlined above, will be applied now as a Gedankenexperiment and for purposes of illustration to the emergence of labour management within capitalist economies.

The considerations will built on previous work done by the author, partly in collaboration with *C.C. v. Weizsäcker*. The theses developed there will be briefly sketched in the following; for a more detailed statement of arguments the reader is referred to the original essays*.

2.1. Labour Immobility as a Necessary Precondition for the Workability of a Labour Managed Economy

A capitalist firm is characterized by the fact that the decision making authority rests ultimately with the owners of capital of the firm. The owners of labour are paid out directly for labour services. On the other hand, a labour manged firm is characterized just in the opposite by decision making authority resting ultimately with the owners of labour, and capital owners are paid for capital services.

Although no legal rule within capitalism prohibits the formation of labour managed firms, these firms have not emerged in considerable numbers; it seems that labour management has been competitively inferior to capitalist management up to now. What are the reasons for that?

As is well known, there has been much theorizing with regard to this question. *v. Weizsäcker* and *Schlicht* have traced the problem to an insufficient solution to what has been called the commitment problem: In a labour managed firm, the decision makers will not be committed to the long-run interests of the firm; as long as there is freedom of choice of employment, workers will have any incentive to maximise short-run benefits at the expense of future consequences: Social and private interests diverge.

* *v. Weizsäcker/Schlicht* (1977) on labour management, *Schlicht* (1978) on labour market theory. See also Furubotu's criticism of the *Weizsäcker/Schlicht* thesis.

But this holds true only as long as there is some de-facto mobility of labour. If workers were tied to one firm throughout their lives, the commitment problem would be solved and one can imagine an efficient form of organization of a labour managed firm to emerge through competitive pressures[1].

Note that this would become true if there were sufficient de-facto immobility of workers, irrespective of the legal construction used in the employment contract. It can be achieved, for instance, if workers had to face severe losses in case of changing the firm since remuneration is tied to seniority.

It will be argued in the following that there will evolve strong competitive pressures working in that direction, i.e. producing de-facto immobility of labour, and creating the very precondition for the viability of labour mangement thereby.

Note that the commitment problem is solved in the capitalist firm by tying the firms capital to the very existence of the firm: Although an individual shareholder can sell his share, the capital represented by that share remains within the firm. The rational policy of a shareholder is, therefore, to foster policies which maximize the present value of the share, and hence the firms' long-run profitability.

2.2. The Tendency to Labour Immobility

If technical progress is characterized by an increasing degree of automation, this implies that labour will be directed, with the passage of time, towards maintainance, supervision, and administration. These fields of activity, however, are characterized by much firm-specific on-the-job training, and by high turnover costs[2]. Think of a computer operator who will need a long time to get aquainted with the particular computer system installed at your department, or think of computer maintainance which requires very specific knowledge of one particular model, or think of a secretary who needs quite a long time to become aquainted with the particular organizational structure within which she is required to operate efficiently.

Since this is so, turnover costs will become an increasingly important cost factor for the individual firm[3]. Firms will try, therefore, to reduce turnover costs by making the staying with the particular firm more attractive, e.g. by increasing pay above what is considered to be normal, or by offering attractive promotion ladders within the firm. All this will increase labour costs.

In order to be attractive, each firm will try to be above the standards of its competitors, and since each firm behaves in that fashion, labour costs will be pushed up inducing a further increase in automation, and increasing unemployment. The increase in unemployment, however, will finally reduce labour mobility such that a stable average wage level emerges.

Thus technical progress will lead eventually to a de-facto-immobility of labour. In more abstract terms, this can be also explained within the organizational failures framework (see *Williamson*). If it is socially optimal to have labour mobility, an organizational framework will develop which allows for mobility, e.g. the capitalist firm; if it is socially optimal to have labour immobility since turnover cost outweight potential mobility advantages, an organizational framework will develop which leads to de-facto immobility of labour.

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1 That is, the notion of labour management used here does not imply any particular mode of internal organization such as direct democracy.

2 See *Becker* with regard to specific on-the-job training. Turnover costs are defined as the losses which occur if an experienced employee is replaced by a new one.

3 Presently, the rule of thumb is to assume turnover costs to be equivalent to an annual income of the particular kind of job where replacement occurs, see *Marr*.

2.3. The Switch to Labour Management

This reduction in de-facto labour mobility will be obtained, through the joint pressures of technical progress and competition, whithin the organizational framework of the capitalist firm. Assume now that this de-facto immobility is obtained through the process mentioned above (or through some other process).

According to the previous psychological argument, people will cease to interpret their employment contract as an exchange relationship and will start to consider it as a reciprocity relationship, resting on an initial employment contract which creates permanent rights and obligations between employer and employee. (This has been discussed already in section 6 of part 1 above). Or to retake the inital argument about triangle and square: Although the ruling legal interpretation of the trapezium is still that of a modified triangle, people will start to look at it as a modified square. This is where the switch to labour management occurs.

There will be political dissatisfaction with the ruling interpretation of the firm as directed by the owners of capital; rather the firm will be identified with the workers which "constitute" the firm. If there is much technical progress, machinery will be changed repeatedly but what remains permanently associated with the firm is the working staff. The legal construction of labour management will seem natural, therefore, and the economic pre-condition for its viability, i.e. labour immobility, will be firmly established. In addition, the capitalist firm will suffer from competitive disadvantages which result from the fact that its form of organization is considered to be unjustified: The dissatisfaction of the staff implies additional costs (i.e. efficiency losses or additional control costs and better pay to compensate for these defects). Within this scenario, the transition to labour management will take place: The switch to labour management will occur on the level of the social scheme, inducing real rearrangements. The switch, however, will occur discontinuously: There is no intermediate social scheme between labour management and capitalist management although numerous intermediate arrangements are conceivable in reality. The German co-determination provides an example here, but it provides an example, too, for the fact that mixed forms of organization will be interpreted as modified cases rather than self-sufficient constructions in their own right.

Appendix A: The General Analytical Procedure

The analytical procedure underlying the analysis of this paper can be characterized conveniently by the following sequence of questions and answers.

1. Q: How do people *perceive* the social world?
   A: They perceive the social world in terms of a *scheme* of organization.
2. Q: What happens to perception if the social world is undergoing continuous change?
   A: There will occur, at a certain point, a *gestalt switch*, where the old scheme will be replaced by a new one.
3. Q: What are the consequences?
   A: The *normative beliefs* of poeple will change since all divergencies from the social scheme require special vindication.
4. Q: What are the *real* consequences for the organization of society?
   A: There might be none if the new set of normative beliefs happens to be such that there exists no form of organisation which is workable and corresponds to those normative beliefs. Then the contradiction between normative beliefs generated by that particular type of society and its rules of organization will persisist*.

* e.g. if, in the example studied in the paper, labour management were not workable or were competitively much inferior to capitalist management.

On the other hand, if there exists a workable form of organization corresponding to the new scheme and the new set of normative beliefs generated by this scheme, this new form of organisation will be adopted[1].

Appendix B: On the Japanese firm

The central feature of labour immobility can be observed in the case of the Japanese firm, too — but the Japanese firms have not turned into labour-managed firms, of course as the above analysis would suggest[2].

Although this criticism does not touch the central proposition of the paper regarding the discontinuous character of social change on the level of the social scheme, it points at a crucial feature of the theory proposed here, i. e. that the social scheme will not necessarily be unique and we might be confronted with a case analoguous to that of an ambiguous figure. Under these conditions, it seems to me, preference will be given to that scheme which can be regarded as closer to the old scheme, and I feel this to be labour management rather than feudal management in the context of the above analysis — but this is a difficult point, requiring further investigation.

It should be noted, however, that a feudal arrangement will be feasible only if there is a possibility of direct supervision and control, but this is virtually excluded by the assumption of technical progress involving much on-the-job training and increasing job idiosyncrasy. In this case, the interests of the workers have to be tied to the firm in such a way that they feel themselves to be personally committed to the firm. This, however, cannot be achieved by command.

Appendix C: Hierarchical Storage of Data

The following example shows that hierarchical organization of a given set of data is advantageous economically even in the case when the data to be stored are not naturally grouped and completely unstructed. If the data were grouped naturally, e.g. by a high correlation of the probability of recall within each group, this would render grouping — and hence the formation of a hierarchy-even more efficient[3].

These considerations might give some theoretical support of the thesis about the hierarchical character of mental organization which has been used in the text.

Assume that 27 items are to be stored and are to be recalled with equal frequency. One check needs one time unit. If the items are stored successively (fig. 6), the average search time is $\frac{1}{27} \cdot (1 + 2 + 3 + \cdots + 27) = 14$.

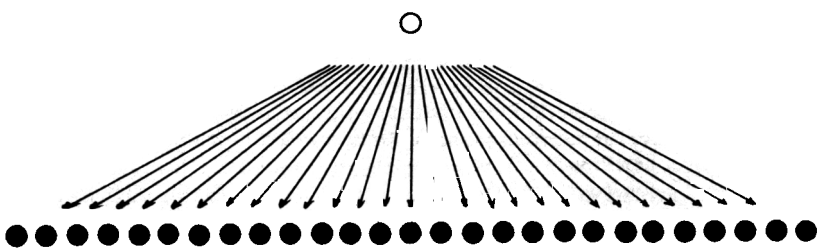

Fig. 6

[1] e.g. labour management, as argued in the analysis of the paper.

[2] This point of criticism is due to *C.C. v. Weizsäcker*. *Tom Romer* and *Jan de Graaf* have raised related problems.

[3] *Köhler* (1947) has argued that spontaneous grouping can be explained by its survival value which is derivative from natural grouping within our environment.

On the other hand, if the items are organized hierarchically in the way indicated in figure 7, i.e. in a three-level triadic hierarchy (i.e. with a span of three knots), average search time will

$$\frac{1}{27} \cdot \Big\{\Big((3+4+5)+(4+5+6)+(5+6+7)\Big)+$$
$$+\Big((4+5+6)+(5+6+7)+(6+7+8)\Big)+$$
$$+\Big((5+6+7)+(6+7+8)+(7+8+9)\Big)\Big\} = 6$$

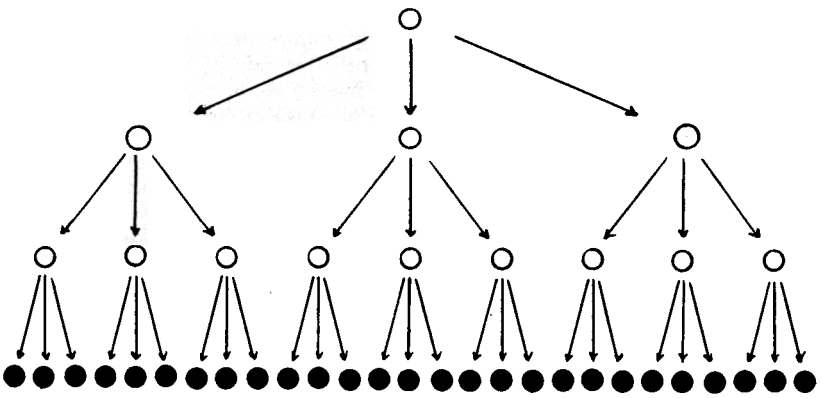

Fig. 7

In these figures, the solide circles represent the *items* to be stored and to be recalled, and the open circles represent the addresses of classes, which can be thought of as abstract *notions* or, possibly, as *general principles of action* which have to be applied in order to derive a specific rule of action appropriate under particular conditions.

Quite generally, a n-level triadic hierarchy will require an average search time of 2n and will have a capacity of 3^n that is, search time is a logarithmic function of capacity in a hierarchical file whereas it would be a linear function in a simple sequential file. With large amounts of data, the advantages of a hierarchical organization become tremendous. If the number of data where 10^{10}, for instance, average search time in a triadic hierarchy with 21 levels would be less then 42 whereas it would be $5 \cdot 10^9$ in the case of sequential storage. Furthermore, the notion of hierarchy, as used in the text, has to be taken in a broad sense covering also information structures like figure 8, for instance, where there is a possibility to go from lower levels of a hierarchy to higher levels.

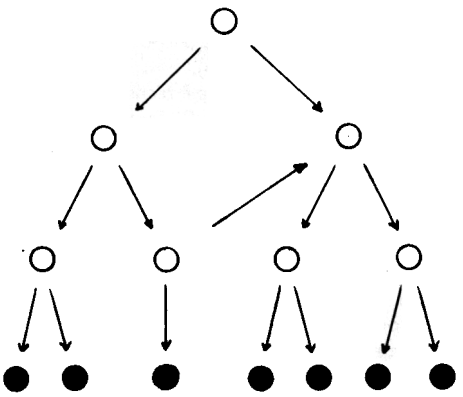

Fig. 8

Once the comparative efficiency of grouping is taken for granted, one has to ask, of course, which kind of grouping will be optimal. If it happens that lexicographic grouping by attributes is chosen, this will induce the discontinuities as discussed in the text*.

Summary

Society interprets its rules of social organization and interaction as modifications of pure, or simple, or prototype rules, rather than viewing the prevailing set of rules as a self-sufficient archetype. This leads to the proposition that continuous social changes might entail discontinuous switches in the scheme of social organization.

As an economic application of this reasoning it is argued that technical progress leads to an increase in turnover costs and, through competitive pressure, to an increasing immobility of labour. This leads to the competitive viability of labour management as argued by *v. Weizsäcker* and *Schlicht* (Z. ges. Staatswiss., Special Issue 1977), and, simultaneously, to a switch in the schme of social organization providing the necessary normative underpinnings for labour management.

Zusammenfassung

Die Regel, welche die gesellschaftliche Organisation und Interaktion steuern, werden gesellschaftlich als Modifikationen von einfachen, prägnanten oder Prototyp-Regeln interpretiert. Ein stetiger sozialer Wandel wird deshalb mit diskontinuierlichen Veränderungen des Schemas sozialer Organisation einhergehen.

Insbesondere läßt sich argumentieren, daß bei einem technischen Fortschritt, der zu einer ständigen Erhöhung der Fluktationskosten führt, über Wettbewerbsdruck eine zunehmende Immobilität der Arbeitskräfte entsteht. Dies führt einerseits dazu, daß die Unternehmungen schließlich als durch die Belegschaft konstituiert aufgefaßt und nicht mehr mit den Kapitaleignern identifiziert werden. Andererseits werden arbeiterselbstverwaltete Betriebe erst bei einer hinreichend großen Immobilität der Arbeitskräfte überlebensfähig. So ergibt sich insgesamt eine Tendenz zur Arbeiterselbstverwaltung.

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* By the way, if one pursues the example of fig. 7 – which is *not* optimal under the given assumptions – and looks for *optimal* organizational patterns when the set of data increases, one will find similar discontinuities, i.e. that the pattern of organization remains structurally identical for a while, but a further increase in data necessitates a change of the whole structure.

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