

HOW THE ECONOMY TALKS
THE LAW INTO CO-EVOLUTION:
AN EXERCISE IN AUTOPOIETIC SOCIAL THEORY

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I. INTRODUCTION

Let us assume that, due to changes in its interaction with the scientific community, the economy changes. New possibilities of creating value are mapped out internally, and new actions are initiated externally to adjust the relations with the environment of the economy to these new value horizons. One of the relationships to be changed is the one with law. As the economy produces new cases of conflict and addresses them to the law, the legal system receives new information which is fundamental for its own, internal self-reproduction.

This account emphasizes that the self-reproduction of the law is induced from the outside, through « food » for its self-reproductive activity. From the law's point of view, economic value is a source of justice. From the point of view of the economy, in turn, the conversation with law leads to changes in the messages coming from the legal into the economic system. Here, justice is perceived as a source of value.

In Part II, a version of autopoietic social theory is suggested which provides a vocabulary for this account of the co-evolution of two self-reproductive social systems, the law

(*) The paper presented at the 1985 conference was a preliminary version of a book-length study published four years later (HUTTER, 1989). With the exception of a few corrections, the original text and the original bibliography have been maintained.

and the economy. In Part III, some results of a case study on the evolution of a particular segment of the legal system are reported. The topic of the case study is the development of pharmaceutical patent law.

Part IV offers a few inferences that might be drawn from this exercise.

II. THEORY

1. *Paradox: Persons and Conversations*

Social systems reproduce themselves if they can constitute that which functions as unity for the system. LUHMANN has pointed out the central role of paradox in this process:

« Within this continual production and reproduction of unity, distinctions are necessary in order to describe what is and what is not used as a unit. As soon as this distinction is itself described, i.e., itself becomes the object of the same distinguishing operation, a paradox arises. The unit, which can only be described by means of a distinction, cannot distinguish itself against the distinction. This would mean questioning the right (or wrong) of distinguishing between right and wrong. And yet it is precisely this paradox on which all self-referential systems are based — because they do not make it the object of their own operations » (LUHMANN, 1985b:3-4).

Paradoxes have an interesting property. Since their « solution » is a continual switch between the two opposites of the paradox,⁽¹⁾ they provide an infinite quantity of information. Defining information as « a change in an observer's state of uncertainty », KRIPPENDORF has formalized this point. He goes on to explain the result:

« ... a close examination reveals this infinite quantity to be most meaningful. Recalling that paradoxes result from an observer's descriptive inabilities, this infinite quantity shows that such an ob-

⁽¹⁾ BATESON (1979:130) writes:

« Norbert WIENER used to point out that if you present the Epimenides paradox to a computer, the answer will come out YES... NO... YES... NO... till the computer runs out of ink or energy... ».

server's cognitive space and/or language is simply not powerful enough to cope with the complexities in his or her world. ... it does make a lot of sense to say that paradoxes are simply too powerful to be coped with by an observer, and exceed the information processing capacities of that observer. Unless one is able to escape a paradoxical situation, which is what Whitehead and Russell achieved with their theory of logical types, paradoxes paralyze an observer and may lead either to a collapse of the construction of his or her world, or to a growth of complexity of his or her representation of this world. It is the latter which should be characterized as morphogenesis » (KRIPPENDORF, 1984:51).

Thus, a social system carries the source (in a literal, endless sense) of its self-reproduction within itself. It is capable of survival because it has found a way to build an image of the environment's endless change which adequately reconstructs precisely this endlessness. Other systems in its environment will recognize such a social system as one of the sources of their own environment's endless change. These self-reproductive social systems will be called *autonomous systems*.

The discovery of the usefulness of the paradox came at the beginning of human societies. Religious rituals « mark the distinction » (to use SPENCER-BROWN's (1969) terms) between the human and the other, the spiritual world (see LUHMANN, 1984b:624). From at least the seventeenth century on, one began observe a number of paradoxes that serve as « leading distinctions »⁽²⁾ for autonomous systems in our society. The most fundamental ones are those that constitute the unity of law, of the economy, of politics, of science and of art.

It is difficult to talk about leading distinctions because they are paradoxes and therefore can never be transferred into expressions containing finite information. But this difficulty has not prohibited the emergence of terms which circumscribe them.

⁽²⁾ « Leading distinction » is a direct translation of the term « Leitunterscheidg » which LUHMANN (*infra*: *5*) introduces for the distinction with which an autonomous system constitutes its unity.

Such terms allow one in conversation with another person to refer to the image, i.e., one's own internal reproduction of a particular autonomous system's leading distinction. The person will usually speak of its « sense of justice », « sense of value », « sense of power », « sense of truth », etc. ⁽³⁾

⁽³⁾ Since classical formal logic is not capable of processing paradoxical statements, justice, value, power, etc., have been excluded from the scientific vocabulary, with far-reaching consequences for the formulation of the respective theories. However, recognition of the paradoxical nature of justice and value — and we restrict discussion to these two — is not unknown. In the case of justice, traces of recognition can be found in normative legal theory as well as in functionalist social theory. A quote must suffice to make the point. An essay by KELSEN titled « What is Justice? » opens with the following statement:

« No other question has been discussed so passionately... no other question has been the object of so much intensive thinking by the most illustrious thinkers from Plato to Kant; and yet, this question is today as unanswered as it ever was. It seems that it is one of those questions to which the resigned wisdom applies that man cannot find a definitive answer, but can only try to improve the question (KELSEN, 1957:1).

« Trying to improve the question » is, of course, a succinct way of stating the nature of a leading distinction: it can be perceived, it can be changed, but it cannot be reduced to more basic elements, because the term signifies the distinction itself.

The paradoxical nature of (economic) value is occasionally recognized. BAUDRILLARD (1981:139) writes: « Value in the case of use value is enveloped in total mystery, for it is grounded anthropologically in the (self-)evidence of a naturalness, in an unsurpassable original reference. ... Value becomes absolutely self-evident, la chose la plus simple ».

Contemporary neoclassical writers approach the topic in the wake of new developments in systems theory. Both RÖPKE (1977) and HEINER (1983), for instance, suggest an explanation of individual preferences (which is the locus of value in neoclassical theory) through « feedback mechanisms ». These contributions still demonstrate a considerable lag in the reception of systems theory, but they demonstrate an improvement over the traditional strict « exogeneity » of individual preferences in neoclassical economic theory.

An additional difficulty in recognizing the logical type of economic value is due to the fact that the term « value » serves also as a meta-description of all leading distinctions. Since paradox is not simply an abstraction (meta-message), one cannot just invent another word. Therefore, one of them has been selected to serve as a generic term.

How do these fundamental autonomous systems evolve? The account in Part I suggests that the systems « feed » on each other, i.e., use messages from other systems to continue their own reproduction. A closer investigation of this process of co-evolution is aided by a further consideration of the nature of paradox.

In a world which consists only of messages, the observing message is always in a straightforward relationship with the observed « focal system » (WILLKE 1978). It occurs either outside of the focal system, or it occurs within the focal system. In consequence, the observing message describes autonomous systems always partially — just as paradox is always perceived in one of its two states of meaning. The observing message can adapt to this endless oscillation by alternating between an outside and an inside position with respect to the focal system.

This basic thought must now be given operational meaning.

The messages in an observing system outside the focal system (and this is the traditional, scientific position) interfere ⁽⁴⁾ with events in this specific autonomous system in its environment. In this state, the message constructs its « source »: the messages are not « emitted » by the observed system. It is the observing system which, in a state of *informational openness*, uses the mode of « identification », of attributing autonomy to a cluster of events, in order to monitor these events on its « internal screen » (TEUBNER 1987). If an autonomous communication system is in a state of informational openness, it is called a *person*.

The fiction of a « person » is a well stabilized accomplishment of our legal system. In fact, many strands of modern legal development are difficult to imagine without the use of this invention. Juridical persons permit the construc-

⁽⁴⁾ « Interference » is used in the sense suggested by TEUBNER:

« Interfering systems can make their elementary observations directly available to each other ... because of the similarity of their elements » (TEUBNER 1987).

tion of action sources ranging from towns and churches to commercial enterprises. The success of such a construct does not depend on whether the identified person « really » acts. If an intended message using a specific attribution to an autonomous system works, i.e., if the inference becomes a reference in a succeeding message, there is a chance that this person (created in the act of inference!) evolves into one of the figures in the repertoire of the law's — or any other observing systems — continuing internal account. (5)

Now, the message switches to the inside position. The messages within the focal system (and there must be at least one focal system in the society which fulfills this condition) are themselves an offer of information, especially designed to be used by future messages within the self-observing system. In this state of *cognitive closure*, the messages are limited to the context which in « understanding » is performed. (6) If an autonomous communication system is in a state of cognitive closure, it is called a *conversation*.

The use of the term conversation, is diffuse — as is to be expected of a term which describes itself. After its use in 18th century literature for specific social contexts, the term has been revived recently, by PASK (1985), LUHMANN (1984b) and ACKERMAN (1984). Similar concepts are « discourse » and « dialogue ». Just as was the case with « person », « conversation » is only slowly being accepted as a meaningful notion within legal and economic theory.

Person and *conversation* are the operational, praxis-generated names for the two states of a constitutive paradox. Tak-

(5) Legal theorists have recognized that persons are simply conveniently chosen sources of communication, « an artificial construction of legal science » (KELSEN, 1925:63). In economic theory, there were attempts to use « going concerns » rather than individuals as acting units (see COMMONS, 1931). Recently, the idea has been picked up in intra-firm economic theory (see WILLIAMSON, 1979).

(6) BATESON (1979:51) points out that « the power to create context » is the basic ability of a message recipient. One might add the sender's « power to create a person ».

ing the outside position, a message observes how law changes through the evolution of agents of change: courts, companies, pressure groups, schools of doctrine, etc. Taking the inside position, the message observes justice's change through the evolution of language: changes and additions in legal codes, changes in legal procedure, changes in the dominant interpretation of legal sources, etc. Switching between the two positions, the co-evolution of the two autonomous systems, the economy and the law, can now be explored by forming propositions about the evolution of persons and the evolution of conversations. (7)

2. Two Propositions

Proposition 1 (outside observation). — Persons « plant » their identity (self, unity) into the perceptions of other persons by finding messages which become valuable information to other persons (see LUHMANN, 1984b:160). (8) If other persons reproduce the message as part of their own conversations, they thus acknowledge and reproduce the identity of the sending person. If the communication between two persons increases in value, new persons will emerge to perform specialized tasks. The intensity of communication increases, place, time and participants are standardized to the point where a reference to the new entity as a unity can be more effective than reference to its elements. Persons interacting

(7) Through this maneuver of oscillation, the account is able to talk about the conversation between science, law and the economy, at the same time, and it remains understandable in the three contexts. The « innovative step » of this attempt consists in taking seriously the paradoxical structure of the messages constituting the unity of these systems.

(8) E.M. FORSTER's « Passage to India » captures this point perfectly, albeit with respect to psychic systems and before formal logic had caught up with the reach of his imagination: Just as the story's hero sees the fulfillment of his aspirations, he is accused of a crime and thrown into jail — at which point: « ... he lost his usual sane view of human intercourse, and felt that we exist not in ourselves, but in terms of each other's minds — a notion for which logic offers no support » (FORSTER, 1924:249).

primarily with autonomous social systems (as opposed to biological and psychic systems) will be called *conversation circles*. Conversation circles specialize in facilitating interference between persons with more complex environments.⁽⁹⁾ Their purely communicative nature allows experiments in future scenarios without the time and expense of physical and psychic changes (for the case of art, see LUHMANN, 1984). Of the many variations of conversation circles appearing, some are selected to reproduce the internal communication of the two systems. Over the course of decades, new conversation circles establish themselves as participants in the economic as well as in the legal conversation, while others lose that ability and fade away.⁽¹⁰⁾

Proposition 2 (inside observation). — The processing of new information in a conversation involves three aspects, dictated by the (relational) theory of logical types (see BATESON, 1979 and HUTTER, 1984):

1) A *case* serves as a vehicle of communication. Messages are always seen in the context of some basic interaction — a conflict, an exchange, etc. These cases organize stories. Within the stories are external details; outside of them are all other stories that have nothing to do with them.

2) A *code* is used to translate the case into a form that is storable by the system (« memory ») and that is understandable to other autonomous systems. Usually, a mixture of rituals, routines, jargons and dialects is available for this task. The variety of codes increases the probability of interference. *Media*, i.e., codes using system-external elements, are used to transport messages to other systems — over the air, through newspapers, through legal briefs, etc.

⁽⁹⁾ Not only « formally organized » systems are capable of action (TEUBNER, *infra*). To use a homology: « persons » are as varied in their complexity as the animals we know.

⁽¹⁰⁾ The study of their development and use in law and the economy is a field in itself. From an economic perspective, MARSCHAK (1971) has made a pioneering effort (using the decision-making process of « judges » as an example!) which has gone virtually unnoticed.

3) New information implies that the screen of the communicating system has to be conditioned in a way which makes it receptive to available new messages. Only the response of another system shows whether the attempt has been successful. One can illustrate that process by comparing it with a therapy in which the therapist induces change in the patient.⁽¹¹⁾ The task of the therapist consists in involving the patient in a conversation in the course of which the patient begins to reinterpret his or her own *context*, and thus begins to see future events « in a new light ». BATESON (1972) has shown that play is a major form of context-creation in all societies.⁽¹²⁾

« Therapeutic interaction » is very much a game-like, continuous activity. There must be a flow of variations of cases entering the internal conversation. Some of these cases are selected to go through internal translation and transmission. In turn, a few of the selected cases become elements of the doctrine.

They are retained as vehicle messages to reproduce (i.e. remember) the mapping of new horizons into the self-interpretation of the autonomous systems involved in the conversation.

The response of the other system (in our case, the law), is, in turn, new information. It is retranslated and transmitted through codes and media. Eventually it will be available as part of the context, as a « matter of course » to new cases created in the economy.

⁽¹¹⁾ TEUBNER (1985:25) calls this the « modulating » or « triggering » effect of the external system. The terms « therapist » and « patient » denote only a communication relationship, leaving open the issue of the respective value of the conversation to its participants.

⁽¹²⁾ BATESON'S notion is quite compatible with WITTGENSTEIN'S (1958) *Sprachspiel*, but incompatible with formal game theory (e.g., SCHOTTER, 1981). Note that « play » is more accurately understood in the sense of « theater ». « Childs' play » is a subset using predominately psychic environments. For interesting observations on « Court as a theater » see RASEHORN (1980).

3. *Method: Focus and Periphery*

If the subject/object distinction of classical science is replaced with the inside/outside distinction of systems theory, the scientific person observing two other systems, like the economy and law, is outside. It would be inside, however, were it to try and delineate an area of observation, a subject matter etc. for itself. The « scientist » or « science » imposes its own conversation on the event and thus falls into a dilemma well recognized since HEISENBERG's treatment of it: the harder it looks, the more it observes itself and not the events. Science, as well as all other social systems, must therefore resign itself to « therapeutic interaction » with the observed systems of its environment.

Again, the dilemma can be alleviated by playing with the structure of paradox: the story pretends to do one action while actually performing its opposite. That is to say: the observation focuses on the actions of a specific conversation circle; a specific organization; or on one episode of conversation; or on one text containing a few messages. Holding the focus of description on these elements of the co-evolution of the two systems studied — which, in themselves, are of no remarkable relevance — allows a reading person to reproduce the periphery of the observed episode in its own mind — or, more accurately, in a social system's equivalent to a psychic system's mind.

It thus becomes easier to note the numerable connections of the observed conversation circles and episodes with the autonomous systems which have reproduced them and which, in turn, they are about to reproduce.

III. OBSERVATIONS

1. *Setting up the Case Study*

Given the limited means of a single researcher, I have focused on a field of interaction between the economy and law which fulfills the following criteria:

- 1) obvious connection between economy and law;

- 2) comparatively rapid changes in the conversation.

Both criteria are satisfied by the pharmaceutical patent conversation.

Basically, the patent is an extension of the older institution of property, as a response to systematic scientific research and the commercial development of new products. Its recorded beginnings date back to 600 B.C. (LUTTER 1922), and it has been stabilized in the environment of industrialized economies since the nineteenth century. Within the patent conversation, subtopics have emerged. One of them deals with patents for pharmaceutical claims. This is a field with exceptionally intensive patenting activity. We can therefore restrict the focus of observation to one subtopic, while at the same time fulfilling the second criterion postulated, i.e., the expectation of comparatively rapid changes in the conversation and its persons. As we focus on this subtopic, its peripheral connections appear, like links with other fields of industrial property, especially licensing, with unfair competition and with political regulation (see Part IV). In this restricted area, I expect to find the conversation circles and — moving the observation inside — the cases of « therapeutic interaction » predicted by the two propositions of Part II.

My investigation was limited to the history of pharmaceutical patent law after 1945. Although the scope of the study was international, most of the material was compiled in three countries which allowed a comparison of widely diverging economic, legal and political circumstances: the Federal Republic of Germany, the United States, and Italy.

The following sources were used for data collection:

- a) Personal interviews with several dozen participants in each of the three countries: heads of pharmaceutical company patent departments, patent agents and lawyers, association staff, judges, patent office representatives, etc.

- b) Internal communication documentation of participants: although most of this material is not accessible or is confidential, diverging standards of confidentiality have helped to obtain some letters, memos and protocols of meetings.

c) Publications by conversation participants: this category includes annual reports of patent offices, associations and companies, as well as the vast literature in professional journals. These contributions are predominantly authored by patent lawyers and agents. They serve, beyond the topic of an article, to advertize the skills of the author.

It must be emphasized that the outcome of the investigation was completely unknown at its beginning. For all that I knew in 1982, there might not have been any noteworthy change in the patent law, and industry might have been content to secure its « property rights » for new inventions, without making the effort to change the institutions which generate these rights. The result, however, exceeded my expectations. In all three countries as well as in the international field, a continuous flow of intensive activity can be reported. There is ample evidence for the emergence of conversation circles and the processing of new issues in conversations involving the economy and law.

Given the scope of this paper and given the qualitative nature of the evidence, the presentation is restricted to a few results of particular interest.

TABLE 1 - *List of Club Memberships of Head Officer of Patent Department*

Bundesverband der pharmazeutischen Industrie (BPI) - member, IPC
 Verband der chemischen Industrie (VCI) - chairman, IPC
 Bundesverband der deutschen Industrie (BDI) - member, IPC
 Verein f. gewerblichen Rechtsschutz und Urheberrecht - member, IPC
 Union of Industries in the European community (UNICE) - member, IPC
 Council of European Industry Associations (CIFE) - member, IPC
 European Chemical Association
 Int. Assoc. for the Protection of Ind. Property (AIPPI) - member, governing board and program committee.
 Interpat
 Institute of European Patent Attorneys
 German Ministry of Justice - Board of advisors
 Standing Adv. Council of European Patent Office (SACEPO)
 Diplomatic Conferences - member of delegation
 (IPC: Industrial Property Committee)

The list is certainly incomplete, omitting formal, less time-consuming memberships as well as — possibly — those memberships the interviewer is not supposed to know. Still, the list provides an image of the many tongues with which a patent department has to speak if it wants to perform its job of communicating the concerns and interests of its company adequately.

I will discuss some of the characteristics of the conversation circles with which this « focal individual » is involved.

(1) *Mix of Leading Distinctions and Awareness of Paradox.*
 — The investigation has revealed a web of persons, interacting inside each other and between each other: patent departments, agencies, courts, law firms, industry association sub-committees, working parties, diplomatic conferences, etc. They all are identified through their particular mix of leading distinctions, as perceived in their messages. Some are dominated by clear adherence to a simple, codified form of value or of justice. Others specialize in a balance between the two, or even more leading distinctions — those of the political and the scientific system, for instance. Again others are characterized by the identities of persons acting or speaking through them. New informational needs lead to the emergence of persons using a new mix of codes and leading differences, while superfluous persons fade out of the conversation. This web of persons functions so smoothly that it creates the impression of a conversation moving along all by itself. But the maintenance of this web, its continual reproduction is part of both the economy's and the law's self-reproduction.

The participants seem to realize that their work does not follow the laws of our traditional theory of rational thought: as a rule, the terms « game » or « play » are used to characterize interactions — which is one way to describe paradoxical interaction. A similar distinction occurs in considering the « assets » of persons. On the maintenance level, relationships are built on a capital of code and media know-how and of contacts. This accounts for predictability in the

use of a person's skills and instruments. Beyond that, credibility is needed — which refers to new situations, situations neither of the conversation participants has experienced before. It is not uncommon to find complete reliance on a person's « word » as an effective way to obtain information. ⁽¹³⁾

(2) *Hierarchies and Cross-connections.* — Circles exist for conversations on pharmaceuticals, on chemicals and on all industrial patents. They exist in national (sometimes even regional), continental and worldwide markets. Every one of these dimensions delineates a separate topic. Some of the conversation circles (Interpat, SACEPO) have a flat structure, i.e., little internal organization. Others (VCI, AIPPI) have elaborate internal structures and employ professional full-time staff.

Conversation circles also group participants who belong to different professional contexts: company lawyers, private lawyers, judges, patent office and ministry officials, etc. Conversely, conversation circles for special professions are connected through the memberships of individuals who are active in several professional capacities. For example, a head of the patent department may be a company representative, a patent lawyer and an industry employee. These cross-connections facilitate a simultaneous discussion of issues in all the conversation circles to whose agenda a particular issue may belong.

(3) *Forms of Conversation Circle Development.* — Three general forms can be distinguished:

a) Emergence of a subdivision in an already existing circle.

b) Emergence of a new conversation circle.

c) Use of circles conversing with the political system.

Ad a: Emergence of a sub-division in an already existing circle is the rule in large, well-established national and inter-

⁽¹³⁾ The building of this asset contributes to the stabilization of social future in the same way as the building of credit status in narrow economic transactions — in fact, it is a more general formulation of the same phenomenon.

national associations. In most cases, standing committees are formed which perform quite independently. Some associations have developed more flexible techniques. In AIPPI, for instance, a remarkable method has been adopted to deal with the problem of an expensive and sporadic international discussion: emerging issues are discussed by the governing board's program committee, officially declared to be « questions », assigned to a temporary working party of the association, formulated into a position paper and finally voted on by the (tri-annual) general assembly.

Ad b: New conversation circles emerge when new interests are formulated, but a suitable conversation circle for the issue does not exist. At that point, one observes the change from a locus of frequent interaction into a conversation circle with a distinct, nameable identity. Given the fact that these circles evolve over decades, the probability of such an event within the scope of the case study was not particularly high. Yet I was able to identify a number of cases where new courts were formed (*Bundespatentgericht*, Court of Appeals for the Federal Circuit), where participants congregated for a series of conferences (Revision of Paris Convention, European Patent Convention) or where a new association was created.

A particularly clear instance of the latter case is the emergence of *Interpat*. *Interpat* was founded in 1969 by the heads of the patent departments of a dozen large multinational pharmaceutical companies, supported by a few national pharmaceutical associations. Today, around 30 individuals participate in the meeting of the club, and a newsletter is being edited. *Interpat* operates in flexible units: geographical areas are assigned to working parties. The chairman of a working party can rely on the assistance of national affiliates or divisions of member companies and on the service of one or more law firms in organizing national task forces. Needless to say, *Interpat* is a perfect example of the kind of specialized person whose emergence and development social systems theory leads one to predict.

Ad c: the use of circles conversing with the political system is a possible alternative if the costs of direct communication between the economy and law are higher than the costs of persuading another system, usually the political system, into an interaction with the legal system which then produces the desired changes in the law's performance. Up to now, the discussion has proceeded as if there were no knowledge of the traditional way of influencing the law: by convincing the central person of the polity, the legislative, to pass a « law », which, in turn, is translated into messages leading to a reinterpretation of the law⁽¹⁴⁾. The investigation shows that government relations are handled by persons different from those who handle the law relations of a company, and that an entirely different web of conversation circles exists in this field of interaction.⁽¹⁵⁾

Another political aspect of the conversation is the performance of the offices which process the patent claims. In all countries, this task is performed by an agency which fits into the hierarchy of the political system, usually as a division of the Ministry of Justice or of Commerce. Despite this formal affiliation, patent offices are also participants in the legal and in the economic conversation. The decisions of examiners are quasi-judicial in nature; the distinction of tasks between internal Boards of Appeals and a separate Court of Appeals is vague and varies between countries. In terms of financial operation, patent offices tend to perform like independent service enterprises: all smoothly functioning offices are self-financed through application, search and maintenance fees. Wherever the finances become dependent on the (political) budget of their ministries, serious deficiencies (as

⁽¹⁴⁾ Before the differentiation of the polity and law it was thought that « law-giving consisted in efforts to record and make known a law that was conceived as unalterably given » (HAYEK, 1973:81). Only after the differentiation could law-making be used as part of the polity's code. It still is part of the political system's code, and legislative activity is taken out of context if it is interpreted as a process internal to the law.

⁽¹⁵⁾ There is a whole literature on policy process and pressure groups. For a wider-ranging exposition see WILSON (1973).

in the case of the U.S. patent office) or outright failure (as in the case of the Italian patent office) were the result. Not only has the patent conversation led to the development of agencies which, as it were, emancipated themselves from a narrow functional affiliation; it has also been capable of organizational innovation. This has been demonstrated by instituting the European Patent Office (EPO), a self-financed organization processing in 1984 close to 40,000 standardized multi-national patent applications per year. In a remarkable effort involving legal, economic, political and scientific participants in a dozen countries, the EPO has been designed, staffed and put into operation.

The observations recorded above demonstrate the scope of activity regarding the development, maintenance and change of persons. Seen from the economy's point of view, the production and reproduction of such persons is seen as an indispensable precondition for conversations with the law. From science's point of view, the evolutionary process of person variation, selection and retention can be perceived, although the time span under investigation is very short.

2. *Conversation Issues (Inside Observation)*

The recent history of Pharmaceutical Patent Law in the three countries investigated is full of issues which went beyond some slight adaptation of rules and procedures straight to questions of justice in the patent field. Such issues are of particular importance to the theory because they involve not only an application of legal processes, but also a change of legal doctrine, i.e., a successful therapeutic interaction.

For reasons of comparability, I have focused on two episodes where conflict arose from the continuous question of patentability: as new fields of invention are discovered, the distinction between patentable and non-patentable inventions is again and again redrawn.⁽¹⁶⁾

⁽¹⁶⁾ Note that law is used by the economy to make uncertain events amenable to risk calculation. The law's function is used to make new prospects

Episode 1: Diamond v. Chakrabarty

In 1972, General Electric Co. filed under the name of its employee A. Chakrabarty a patent application which included a number of claims to man-made organisms, i.e., bacteria capable of breaking down oil spills, and procedures for its use. The examiner and the Board of Appeals of the Patent and Trademark Office (PTO) rejected these claims. In 1977, the case reached the Court of Custom and Patent Appeals (CCPA). In a split decision, the court reversed the rejection. A writ of *certiorari* to the Supreme Court was filed. When a similar case reached the Supreme Court (*Diamond v. Bergy*), the Court saw an analogy of both cases to a recent case in which it had rejected a patent claim for a computerized method used in alarm devices (*Parker v. Flook*). Having been asked to reconsider, the CCPA upheld its opinion pinpointing the issue of patentability even further, using both *Chakrabarty* and *Bergy*.⁽¹⁷⁾ Before the Supreme Court heard the cases again, *Bergy* was dropped. In 1980, the Supreme Court affirmed the CCPA decision (206 USPQ 193 (1980)). In 1981, the PTO issued the patent to General Electric and began to examine the backlog of over a hundred similar applications.

The entire episode focuses on one specific change of legal language: within the law, within industrial property law, within U.S. patent law and jurisdiction, the terms « composition of matter » and « manufacture » are in use (USC 35, sec. 101). Only these words are being reinterpreted in order to provide patent protection to micro-organisms.

I will now try to reconstruct the sequence from the original case to a change of context of the law back to cases under new constraints.

possible, rather than to secure existing claims. (See KITCH, 1977, and ACKERMAN, 1984).

⁽¹⁷⁾ See the CCPA decision (201 USPQ 355 (1979)) for the best account of the story up to that point in its development. See also HUTTER (1986).

The question whether forms of life are statutory subject matter remained moot as long as there did not exist an actual claim for such an invention. Once basic research had progressed enough, a number of patent claims were made that touched on the issue. The patent community, i.e., all the conversation circles participating, had just been waiting for that to happen.

There were three cases contending for use as a « vehicle » of the issue: *Flook* proved unacceptable because it involved an « idea »; *Bergy* was withdrawn in order to concentrate the issue on the more clear-cut claims; thus, *Chakrabarty* emerged as the paradigmatic case.

It took nine years to answer the economic question of property rights on certain research results through translating it into a question that was internal to the legal system: are life forms patentable subject matter? The coding process went through the following stages: Application for claims (GE) — reasons for rejection (PTO) — reasons for appeal of rejection (GE) — reasons for rejection of appeal (PTO/Board of Appeals) — reasons for court appeal of PTO rejection (GE) — reasons for reversal of rejection (CCPA 1) — appeal of reversal via *certiorari* (PTO/Solicitor General) — vacation of judgment and reconsideration in light of *Flook* (Supreme Court 1) — reaffirmation of reversal (CCPA 2) — affirmation of reversal of rejection of claims (Supreme Court 2) — grant of claims (PTO 2) — grant of claims upheld until *Chakrabarty* decision (PTO 3).

To induce change within the legal system requires a change of the context in which the legal system — especially the person called « Supreme Court » — understands the question transmitted to it.

In *Chakrabarty*, the phase of the conversation during which this shift in context occurred can be observed with unusual clarity. The question was explicitly stated in the first CCPA decision. The Supreme Court responded that the answer to the question had been enunciated in *Flook*. The CCPA responded that it had been misunderstood and rephrased the question. Now the Supreme Court understood

why the CCPA had held that « living things » are patentable. The Court reiterated the CCPA's opinion in the following words:

« Congress thus recognized that the relevant distinction was not between living and inanimate things, but between products of nature, whether living or not, and human-made inventions. Here, respondent's microorganism is the result of human ingenuity and research » (206 USPQ 199).

In arriving at this result, both courts had followed the traditional method of retelling the story with a new emphasis. The emphasis was now on « unanticipated inventions », rather than on « exclusion from subject matter ». Both interpretations are possible, and the choice depends on a court's perception of the present situation. Thus, the conversation partners were able to invent a legal analogy to an inventive activity that had taken place first in the scientific and secondly in the economic system. The result is an adjustment of the legal language to that invention, mapping, as it were, uncertainties into the law which correspond to the horizon of new possibilities opened by the invention.

In *Chakrabarty*, we are able to pursue the process of « changing one's mind » even one step beyond the Supreme Court's decision as such. Just as a good therapist would try to pinpoint his messages to certain triggers within the patient, one would want to pinpoint such points of leverage within the circle called Supreme Court. In other words, one does not need to change the mind of every individual acting within the court to get a new answer. The mechanics of that shift in *Chakrabarty* were as follows: The Court had voted 3:6 *in re Flook*. If the CCPA's decision in *Chakrabarty* was to be affirmed, a 5:4 majority was necessary. Therefore, two judges had to change their minds.⁽¹⁸⁾ Now, the minimal change is identified, and this minimum was not unknown to

⁽¹⁸⁾ To speak of a judge as an individual is a remnant of the old terminology. The acting person is a judge's office, to whose internal conversation a judge, law clerks and others contribute.

the participants in the conversation. Judge Rich, reporting judge in both CCPA decisions *in re Chakrabarty*, put it into a nutshell a few years after the Supreme Court's decision:

« The basic purpose of the *Chakrabarty* opinion ... was to hook at least a couple more law clerks ... all I wanted was two more dissenters, which would make a majority, and that is what we got » (BANBURY REPORT, 1982:267).

Once the Supreme Court's opinion on the question was out, the next phase in the sequence began: de- or re-coding of the legal answer into an economic answer. The immediate increase in the stock market's « present value » estimation of bio-research-intensive companies was only the first step in that process.

From then on, the language of patent claims kept referring to the new interpretation and we can rest assured that the continuing flow of inventions in the field will provide enough material to maintain an ongoing conversation around this issue, with new legal solutions, followed by new economic inventions, followed by new legal solutions.

Episode 2: Sentenza n. 20

Sentenza n. 20 of 20 March 1978 declared the non-patentability of pharmaceuticals, as stated in the Italian Legal Code, to be unconstitutional.

This episode is far more complex than *Diamond v. Chakrabarty*. The focus, therefore, will be less sharp.

During the consultations for the first Italian patent law in 1855, a group of pharmacists succeeded in excluding medicinals from any patent protection. In the course of a general reform of industrial property law, a decree was issued in 1934 which permitted patents for pharmaceutical processes, but executive regulations were never issued and a subsequent decree renewed the non-patentability of medicinals (R.D. 1127, 26 June 1939, Art. 14, par. 1).⁽¹⁹⁾ In 1946, the highest Court of Appeals declared Art. 14, par. 1, un-

⁽¹⁹⁾ For a detailed account of the legal history, see FLORIDIA (1983).

constitutional. The argument turned on the legislative powers of governmental decrees. The newly inaugurated Constitutional Court took up the matter in 1957 and vacated the decision. Now, the discussion shifted to the political arena. Countless drafts of bills were submitted in both chambers of parliament. The impact on the political system, however, was neutralized by opposing interests within the industry. Decades of non-patentable pharmaceuticals had led to a flourishing production of imitative drugs, not only for the Italian market, but also for the many markets in the Third World which are without any patent protection for pharmaceuticals.

It was one of the first tasks of *Interpat* to change this unsatisfactory state of affairs. The preferred strategy still consisted in pressure on political contacts through foreign governments and companies as well as the national association.

In 1974, the Appeals Commission (*Commissione dei ricorsi*) showed first signs of wavering. Intermediate medicinal products were declared exempt from Art. 14, and all rejections of claims due to Art. 14 were suspended. In April 1975, the Commission issued the first of 18 ordinances with one identical text. The decision used a new argument: Art. 14 violated the constitution with respect to equality (Art. 3), promotion of research (Art. 9) and clear attribution to public or private ownership (Art. 41-43). In one of the many commentaries that followed, the commission was congratulated on its « freshness and vigour of thought » (FRANCESHELLI, 1975:440). In 1978, the Corte Costituzionale (20 March 1978, sentenza n. 20) declared Art. 14, par. 1, to be unconstitutional. The Court relied strongly on the argument of the Commission, and on the historical reasoning of Ciba-Geigy's counsel, a prominent patent lawyer, professor of industrial property law and long-time editor of the patent conversation's most renowned medium of communication.

From one day to another, pharmaceuticals had full patent protection. But when the patent office released about 650 patents almost immediately, the process of retranslating the change in the law was just beginning. A number of bills,

from a draft by the pharmaceutical industry association to one by the Communist party, were introduced in the Senate. The result was a compromise draft, with a number of patenting restrictions, which was sent to the Chamber of Deputies (S.2475). At this point, *Interpat*, supported by the industrial and professional associations, set in motion a wide-ranging campaign — press articles, conventions, diplomatic interventions, telegrams to members of parliamentary committees, etc. — to stall S.2475. The bill was never discussed on the House floor and lapsed at the end of the legislative period, in 1983.

Now, the industry saw itself before the task of substituting the traditional function of the political system. The president of the industry association, *Farmindustria*, suggested and found, after long negotiations, consensus on two « *normative di autoregolamentazione* »: (1) Free licenses were to be given to firms who had invested in the production of drugs now protected through patents; and (2) imitators refrained from the production of drugs where patents had already been secured in other countries and therefore could not be obtained in Italy anymore.

Currently, the Italian pharmaceutical patent conversation deals with numerous cases of code development: questions of violation and invalidity, of extension of claim, of designation of use, etc., are on the agenda of lower courts, of direct negotiations, of professional conferences, of journals and commemorative volumes.

I selected this episode mainly because of the intensive activity after the change in the law. The episode does show the importance of the political system in stabilizing the subsystems in its environment. Secondly, it shows that the political system is not indispensable. Its function can principally be replaced by « political » behavior within the economic or legal system. Thirdly, the episode shows the dependence of the national context on the international context: Italy was among the signatory states of the European Patent Convention in 1973, which foresaw the full patentability of pharmaceuticals. Although there would have been the possibility of

prolonging a state of exception for a while, the adaptation to European standards was certainly intended by the Italian delegation. Thus, the patentability of pharmaceuticals was « in the air », as some participants expressed it. But this is just a variation of an observation noted above: every strategy of change tries to create the impression that the conversation simply follows its « natural course ».

Both of the episodes presented deal with the interpretation of what is « just » in a specific legal system. They do not tell the story of fundamental changes. Such changes might take centuries. The observed changes are smaller, less visible, more specific.

The magnitude of resources spent on these « therapeutic interactions » is remarkable. Numerous persons, especially conversation circles, are involved in the process at various stages. Observing from the inside, these persons already exist; they are self-evident carriers for the reproduction of the conversation. Expenditures would be underestimated, however, if we were to consider only successful episodes like the ones reported above: as in any search process, there is a high degree of failure. There is also a high degree of redundancy in the projects: every issue is pursued in various circles, using various codes. The malfunction of an entire conversation (as in the case of Italian politics), a particular case or a particular argument is counterbalanced within this « web of communication ». It is this elaborate network of established norms and doctrines, contacts, media, terminologies and « hard cases » which overcomes the improbability of understanding in both episodes and makes it seem — after the fact! — as if the particular change in the legal system's context was a « matter of course ».

IV. PERIPHERAL ISSUES

In Part II, I suggested a solution to the paradox of applying social systems theory to scientific observation, i.e., to itself: select a focus of study and observe its periphery.

In consequence, this exercise cannot have a summary. Summing up the « results » of the case study misses the point, since the study is but the vehicle for the reader's own observation of peripheries. The points noted below are therefore only examples of peripheral observations, again from a conventional outside point of view.

Peripheral in law are conversations beyond the patent topic: industrial property, trade regulation, antitrust, tax law, corporation law, labor law, environmental law — in short, all the topics which might have value to economic persons. In these areas, one should be able to observe the existence of an ongoing conversation, with well-established, well-adapted conversation circles and a well-differentiated understanding of doctrine. These conversations only reach certain sections of the law. They reproduce the economy's image of law, and this image always depends on the autonomous reactions of the law. It is up to the conversation internal to law to integrate these as well as other strands of the conversation with external systems without compromising its own unity.

Peripheral in the economy are industries with characteristics similar to the pharmaceutical industry: high rate of innovation, international product markets and sufficient size to support a large variety of transactions with persons outside of the economy. In such industries, one should be able to observe a similar emergence of conflicts as interactions enter areas yet uncharted by norms, similar webs of conversation circles, and similar expenditures for transactions with external systems. The complexity of such conversations depends on the age of the industry. If the industry is new, its lack of size and experience might not yet allow it to develop the network necessary for conversation with law, and if the industry is old, its lack of innovation might bring it to use an existing conversation to protect current property rights against other, more progressive national or foreign industries, rather than inducing innovation in law.

Peripheral to both these systems are other autonomous systems, especially the polity. Its importance was down-

played in the case study, in order to perceive law as much as possible independently of the polity. The episodes showed that it is virtually impossible to neglect the role of the political system in the co-evolution of autonomous systems. Still, it is not indispensable, and direct interaction with other systems occurs. The tendency to focus social theory on the political system must also be seen as a result of this system's attempt to integrate surrounding autonomous systems into its own power conversation. There is, especially on the part of the political system, the danger of absorption, the misguided belief that an internalization of autonomous outside systems will simplify matters. Such an approach is based on a simplistic, rationalist, non-evolutionary theory. We find that whenever and wherever the political system internalizes, for instance, the economic system, the self-reproduction of value, and thus the ability of that system to handle new complexity, is seriously impeded. Pushing the horizon even further out, the same danger applies to the relationship with psychic and biological systems. They also are part of the co-evolution, and they deteriorate if they are — in the case of the economy — reduced to « work force » and « resources », respectively.

Up to this point, periphery was interpreted synchronically. For its diachronic dimension, one note must suffice. It appears that knowledge of the past is commonly overestimated, and knowledge of the future is underestimated. It was one of the most striking observations of the case study that those engaged in a conversation have a very short time horizon towards the past. Even major events in the past are quickly forgotten, and attention is focused on current and future issues. Therefore, the immediate future is quite predictable to the expert: he or she has a schedule of upcoming meetings, expectations about the reactions of conversation partners and strategies for actions. To the outside observer, this firmly symmetrical diachronic periphery appears distorted if he mistakes the traces of information (as recorded in the literature) for the « live » information of a person acting in a conversation.

Instead of focusing on a case outside of science's internal conversation, one might turn inward and focus on the theory itself, inside of science's internal conversation. Peripheral to social systems theory are the natural sciences, most closely biology, and the formal sciences, most closely logic. Their influence has been noted throughout the paper. Within social theory, I had focused on persons and conversations, as the two complementary views of an autonomous system's constitutive paradox. In their immediate periphery, codes and media kept appearing, although less absolute in their importance than in traditional rationalist theory. Still, they are indispensable for the understanding of communication. Also peripheral, but in the sense of being in the internal environment of observation, is the code of self-reproduction of social systems. Here, little knowledge has yet been gained.

Certainly, with the disappearance of a predetermined plan, the fundamental incompleteness must be accepted not only for the object of study, but also for the theory itself. It is this feature which enables autopoietic theory to internalize innovation, newness, unexpectedness and unpredictability into the scientific conversation. There is no more need in such a theory for the prior existence of some causal agent, as there still was in rationalist theory; the « unknown » is built into the approach.

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