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The Genetic Principle as a Link between Everyday Knowledge and Politics - The Art-of-Teaching Workshop about the Topic "Future"

> "If it is true that one carries the basic factors of political concepts already within himself, although in simpler schemes, political insight would take on the character of a re-discovery."
>
> Eduard Spranger (1963, 12)

This article demonstrates, how didactics of social sciences can turn its focus from theoretical conceptions to the arrangement of learning processes. It simulates a best practice ("Lehrkunst") workshop (I.1.) which compares seven teaching units about the key topic "future" (I.2.). Two typical problems become concrete: exchangeable topics and the transfer to abstract categories. The genetic principle is introduced as a possible remedy: It combines categories with concepts and chooses special topics ("exemplars") that involve students in processes of discovery (II.3.). The concept "future" (Prognosis – Utopia – Political Planning) (I.4.) can be taught in several genetic ways: concentrating on the student's political ideas (individual genesis, II.1.), on the development of scientific findings and social inventions (scientific genesis and genesis of ideas, II.2.), on the simulation of political processes in "embryonic societies" (spontaneous or institutional genesis, II.3.), on the establishment of social innovations and on the historical development of political ideas (historical and human genesis, both II.4.). Conclusion: The genetic principle appears to be a helpful instrument for developing the core curriculum of civic education (II.5.)

I "Best Practice" as Didactics of Genetic Units

1 Invitation to a Best Practice Workshop

Imagine we were civic education teachers, teacher students, didactic scholars or teacher trainers gathered in a course or conference to make the topic "future" didactically accessible. Future as a key political topic, and as a topic of immense importance to humanity (Schulze 1995, 386) should not be missing from the core curriculum of civic education. If each one of us

brought along a published or self-made unit, this would enable us to work on concrete learning arrangements.

We have chosen this new form of didactical exchange for three reasons: First, we have too often experienced didactical meta-debates that did not lead to teachable outcomes. Second, we have followed the conclusions of the German part of the PISA-Study, to promote problem-solving and experience-based teaching methods instead of the dominant teacher-centred question-response scheme (Baumert u.a. 2001, 186, 244 f.). The genetic principle, which aims to involve students in processes of discovery, seems to be an appropriate means to reach our goal. Third, increasing retrenchments of the educational system demand more than ever a time-saving collective apparatus of units.

In order to find best practice examples ("Lehrstücke" = didactic plays) with methodically genetic approaches as model units, we already work genetically by looking at the teaching tradition ("teaching-Frenzel";) see Grammesof our topic: Out of 50 units we pre-selected seven that appear to be representative. We understand didactics no longer as a system of "formal" or "methodical" principles but as a "topic-centred" collection of teaching arrangements (see Berg, Schulze 1995, 11). "Don't work on expressions, work on concrete objects!" (Wolfgang Hilligen) should be the future motto of teachers and didactic scholars. Comparing different units about a single topic enables us to distinguish thematic priorities, methodical varieties and sometimes even - if empirical documents are available - learning processes.

Instead of getting into unproductive controversies about our models, we try them out in a microteaching scenario: Alternately each of us plays the teacher, the others become students. Welcome to a best practice workshop! (see Berg).

2 Thematic and Methodical Variations: Seven Encounters with the Future

Unit 1: Future workshop "Sustainable quality of life instead of global environmental destruction" (Weber 1995; Jungk, Müllert 1996)

Criticism phase: A fantasy trip brings us into the year 2030 and we write down or draw our apprehensions concerning the future condition of the environment. The teacher confronts us with the forecasts of futurologists, asking us to estimate their probability. We work in small groups on main topics (air, water, soil, economic growth, major industries, environmental politics, etc.) and extrapolate our findings to the year 2030 by "alienating" (as defined by Bertolt Brecht) well-known songs, fairytales, TV-news, TV-series, etc. Fantasy (or Utopia) phase: We travel to the "great eco-logical change" in 2030, endowed with the power and money to create our desired future. We present our utopian models in the form of a family discussion, a thriller, a commercial, a report at an envi-ronmental summit, etc. Implementation phase: To realize our ecological utopias, we receive a

collection of ten possible political guidelines and try to reach an agreement regarding their importance. What practical attempts and related obstacles can we find in social reality? What should political parties do? What could we do ourselves?

Unit 2: Our images of the future - The world and me in 30 years (Fickel 1979; Unterbruner 1991; Thurn 1999)

"Close your eyes and imagine what the world and/or your life within this world will look like in 30 years. Draw a picture with your ideas." The pictures are displayed, explained, compared and evaluated. The contrast between dreams (idyllic rural family life, great job, lovely friends…) and fears (war, destroyed nature, famine, poverty…) draws our attention. What can we do about that? We choose typical fears and dreams, collect some background information and provocative material (non-fiction texts, science fiction stories, extracts from historical utopias) and write small sketches for a "forum theatre" (Augusto Boal). By performing them several times in variations we try to find political solutions to the exposed problems.

Unit 3: Atoms, Algae, Automates - Futurology in school (Henningsen 1968)

A social studies class in 1967: Newspapers provide current scientific predictions. The population explosion expected by the year 2000 appears the most urgent problem. Slides from India illustrate its dimensions. The average daily amount of food available for one person in industrial and developing countries is displayed on a table. We extrapolate it to the year 2000, at which point the population in poor countries will have doubled, but the supply of food will have remained the same! What can be done? Birth control, dams, artificial fertilizer, battery farming, algae farming. What about limited fossil fuels? The answer is nuclear power: Mouse traps, arranged one after the other like domino pieces, visualize the chain reaction. In the museum we view our local history. By reading extracts of novels we explore technical awareness throughout history. Is it possible to reduce the increasing amount of traffic by building tunnels and air tubes, or by expanding the use of videophones? What would current middle eastern politics (Gaza) look like if the marathon runner of ancient Greece became our only source of information? How do we judge the "mephistophelian side" of modern means of communication, as portrayed in the film 1984? Finally, we construct a simple thought machine to understand the computers that will increasingly navigate our industrial production. Conclusion: Mankind has always dreamed of possible "futures", which, through realization, lead to both enriching and shocking experiences. So as not to be overrun by the future, we have to look and plan ahead.

Unit 4: Cars 2010 - The scenario technique (Weinbrenner 1995/1998)

We become futurologists exploring the future of the automobile. 1. The problem: Traffic (car exhaust fumes, accidents, noise etc.) grows, political

commitments about carbon dioxide reduction are thwarted. 2. Influences: We identify society, politics, humans, environment, economy and technology as major spheres of influence and sketch their possible interactions using a matrix. 3. Descriptors: We extrapolate qualitative and quantitative trends to the year 2010. 4. Scenario: We combine trends to negative, positive and average (trend) scenarios. 5. Solutions: We draw up a political agenda that supports desirable developments.

Unit 5: Fishermen's game, ozone depletion and climatic upheavals (Ziefle 2000; Ernst 1997)

We are three fisherman clans, making our living only by fishing. Our guideline is to catch as much fish as possible. At the beginning of each season, we are informed about the amount of fish in our lake and decide within each clan which proportion up to 25% we will catch. After a couple rounds (years), the supplies of fish sink dramatically. A second trial leads to a disaster, too. Boat one caught the most fish and became temporarily rich, but all of us will starve in the future (eco-social dilemma). What can be done? A fishermen's constitutional assembly debates different conceptualisations of government (authoritarian state versus grassroot democracy) and ownership (private versus collective), comparing these to the hypotheses of Marx, Locke, Smith and Hobbes. Finally we transfer our findings to real major ecological problems like over-fishing (case study), climatic upheavals and ozone depletion (conference simulation).

Unit 6: Mankind's images of the future (Petrik 2002a)

We watch slides with images of the future from ancient times up to now, and are asked to comment on them at any time. Amongst these images are: The Oracle of Delphi (antiquity); the Apocalypse, the Last Judgement and the Paradies (middle ages); flying human beings, flying ships and other technical dreams (beginning of modern age); victorious citizens during the French Revolution (1789); the year 2000 with cities covered by roofs, automatic dressing rooms and pedestrians wearing gas masks (1900); the new human being after the Russian Revolution (1917); gigantic cities and alien attacks (1920); the naked "Commune One" in Berlin (1967); predictions about depleted resources and system collapses by the Club of Rome (1972); a new ice age, clones, cyber-nomads, giant corn and ecological paradises (end of the twentieth century). In small groups we categorize the images: Fears and predictions, technical and social dreams/utopias and political realizations. How can we assign our own images (see unit 2) to these categories? Which continuities and ruptures show the history of the fu-ture? What is the relation between future and politics?

Unit 7: Women in Utopia (Thienel-Saage 1992)

We receive excerpts from well-known utopian novels:

- Utopia (Thomas Morus, 1516) and City of the Sun (Tomaso Campanella, 1623) as an instance of anti-individualist, patriarchical, puritanical states,
- Supplement to the Trip to Bougainville (Denis Diderot, 1772) as an example of a romantic, harmonious and ascetic rural world,
- Theory of the Four Movements (Charles Fourier, 1808) as a radical demand for women's liberation,
- Travels in Icaria (Etienne Cabet, 1840) as an instance of a rationally planned society and economy,
- Looking backward: 2000 - 1887 (Edward Bellamy, 1888) as a state socialist vision of the USA, and
- Ecotopia (Ernest Callenbach, 1982) as a view of the independent, anarcho-ecological future of California.

Our assignment: To compare the novels under the aspects of marriage, love, children, education, work and politics. Which historic developments draw our attention?

3 From Difficulties in Learning to the Genetic Principle

Which of these learning paths is ideal to introduce the phenomenon future? Ozone depletion, greenhouse effect, over-fishing (disappearance of the commons), population explosion, limited resources, transportation crisis, etc. seem to be "relatively exchangeable teaching topics" (K. G. Fischer). All of them give insight into central categories of the "risk society" (Ulrich Beck): Increase of risks, exponentiality, irreversibility, acceleration, globality, ignorance, uncertainty, dependence on knowledge. Not the political topics, whose lifespan is hardly longer than their presence in the media, but the categories of social sciences represent the actual subject matter, the core of political knowledge. Social studies classes should enable students to use them as permanent toys to analyse various political conflicts.

Still, "pulsating" (Wolfgang Hilligen) between a concrete case and abstract categories and back to a new case proves to be the Achilles' heel of civic education: Students tend to use political terms formally, just learned by heart, without real insight into what they signify, let alone their connection with other terms or their possible contribution to shape a political identity (see Kuhn, Massing 1999).

This phenomenon is what Martin Wagenschein, scholar of the didactics of physics, called "pseudo-knowledge" (Scheinwissen) and what stimulated him to further develop the genetic principle. Likewise, Hermann Giesecke, German scholar of didactics in the field of civic education stated already thirty years ago that categories had to be networked with overarching visions of society, starting with the "social images" that students bring along (see Giesecke 1976, 149).

The genetic principle aims at bridging everyday knowledge and scientific concepts: Instead of leading adolescents through "systematic exhibitions

showing completed expeditions", as it is largely the practice in school, they are encouraged to investigate possibilities to systematize the object, or rather the knowledge about the object, themselves (Wagenschein 1991, 79). The simple methodical "trick" is "to turn dead objects back into the living actions from which they were derived" (Roth 1965, 116).(1) Therefore, the genetic principle is akin to John Dewey's experience-based pedagogy:

"Studying it in process of formation makes much that is too complex to be directly grasped open to comprehension. Genetic method was perhaps the chief scientific achievement of the latter half of the nineteenth century." (Dewey 1966, 214)

"It thus becomes the office of the educator to select those things within the range of existing experience that have the promise and potentiality of presenting new problems which by stimulating new ways of observation and judgement will expand the area of further experience. (...) The issues and problems of present social life are in such intimate and direct connection with the past that students cannot be prepared to understand (...) the best way of dealing with them without delving into their roots in the past." (Dewey 1997, 75 ff.)

So what would a genetic didactics in the field of civic education look like, and in what way would it influence learning objectives, subject matters and methods?

Concepts as learning objectives

Concepts are paradigms of the sciences behind school subjects. They exist in form of "thought and judgement pattern, system, language game or form of action" (Schulze 1995, 365). They interlink single categories to unities and support students to develop cognitive landscapes. Main political concepts reach from democratic procedures of conflict management, decision making, asset endowments, judiciary, dissemination of information (see Grammes, search strategy "form follows function") to complex models of social systems (liberalism, conservatism, socialism, anarchism) which represent basic political orientations (see Spranger 1963, Petrik 2003).

Different genetic approaches to concepts

Depending on which paths of the concepts development we choose (child, mankind, science...), we deal with different geneses, and therefore with different topics, called "exemplars"(Exempel) in terms of the Lehrkunstdidaktik. For natural sciences, possible different learning pathways for the topic "astronomy" look like this (see Berg 1995, 355 ff.):

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Table 1. Variations of the genetic principle in the natural sciences

Genesis	**Object** (Objective genesis)	**Child** (Phylogenesis)	**Mankind** (Ontogenesis)	**Science** (Scientific genesis)	**Spontaneous moment** (Spontaneous genesis)
Didactic perspective	How did the object come into being?	How do children get to know the object?	How did mankind get to know the object?	When and how did science discover the object?	How can we perceive the object?
Exemplar	Big Bang	Homer's flat earth geocentric world view		Galilei as an astronomer	Observation of the sky
Classic teaching units	Herder/ Humboldt	Willmann		Wagenschein	Diesterweg

Collective learning events (exemplars) as subject matters

Exemplars are "collective learning events" (Schulze 1995, 385 ff.), key situations or paradigmatic changes (see Kuhn 1974) that led and still can lead to new conceptual insights. Especially the (simulated) "original encounter" (Heinrich Roth) with influential "authentic representatives" (Hans Christoph Berg) of our culture and sciences, including founders, inventors and explorers (e.g. Galilei), is seen as didactically productive: Science itself becomes visible as a permanent learning process.

In the social sciences we can distinguish amongst three different forms of knowledge of society: Scientific knowledge gives insight into ways of problem solving. Institutional knowledge shows how politicians and other political activists bargain and decide political conflicts. Everyday knowledge helps to cope with personal conflict situations (see the "Model of forms of knowlegde", Grammes 1998, 70). Political exemplars would be productive problems or key events through which social inventions, political ideas and procedures as well as social research methods were developed (scientific genesis), central ideas and procedures prevailed or were established in form of laws and institutions (institutional genesis) and individual values, norms and images of society emerged or changed (individual and collective genesis). Learning about the process of formation of these three perspectives, and being able to distinguish and to see relations between them should enhance the development of political judgement and identity:

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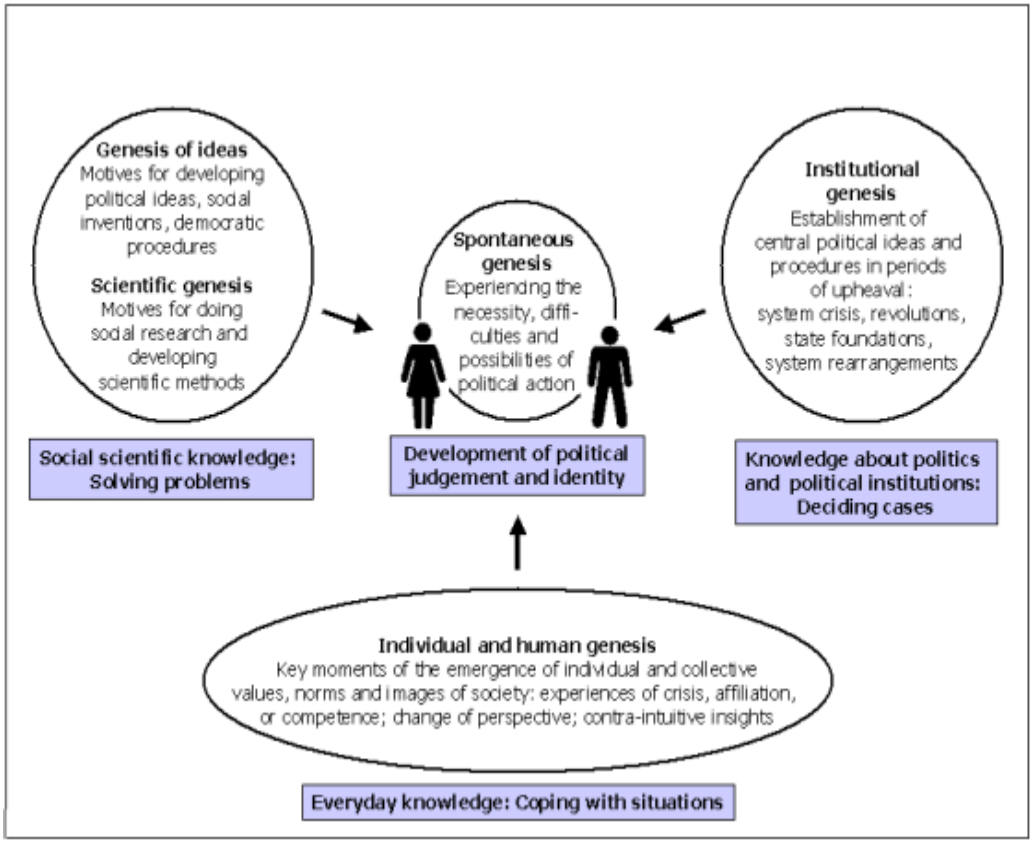
Table 2. Forms of political knowledge and their Geneses



Teaching as provocation of conceptual change

Piaget, Vygotski and Mead describe learning processes as "conceptual change". The pioneer of empirical didactic research in this field is the natural sciences' didactics (see Duit 1996). The genetic principle puts these psychological findings into practice (see Montada 2002, 440): Exemplars are the "perturbations" (Piaget) supposed to evoke "aha-experiences", Wagenschein speaks about "productive confusions". Young people's images of society and theories of everyday life are explicitly welcome to articulate themselves with all their stereotypes and ontological perspectives on social reality (assimilation) - as a major condition to alter and differentiate (accommodation). Initiating conceptual change requires a pedagogical attitude that no longer understands teaching as a transfer of objective knowledge, but rather as a negotiation of meaning (see Gruschka 2002).

Before our best practice workshop looks at genetic traces in our seven lesson units, we have to take a short look at the conceptual insights our topic future offers.

4 The Concept "Future:" Prognosis, Utopia and Planning

Both philosophy and futurology refer to three forms of thinking about the

future: Prognosis, utopia and political planning (see Picht 1992, 8; Flechtheim 1972, 154 ff.)

Prognosis means prolongation of the present, the diagnosis of possible and probable futures (scenarios) by extrapolating past and present trends (see lesson unit 4). Prognoses help to make out unintended outcomes of political decisions (blindness towards the future, time traps, eco-social dilemmas) and to develop solutions that can unfortunately lead for a long time to the same disasters ("The logic of failure", see Dörner 1996):

> "For the average man moves about in this test-tube world, this secondary nature, quite as uncertainly as did his forebears in primitive nature, because only the specialists - and often not even they - understand the things and powers they have brought into being." (Jungk 1954, 19)

Negative predictions cause fear (future shock) and require a sensitive pedagogical handling: Possible catastrophes should neither be played down nor exaggerated ("Didactics of catastrophe"), otherwise students will suppress them, will be paralysed by them or call for supposedly fast and efficient dictatorial solutions.

Utopia

This category deals with the critical analysis of the present by means of a mental break with it. Utopia anticipates desirable futures. The creative act of inventing social realities has always been a basic encouragement for humanity (see lesson unit 7). The German futurologist and inventor of the "future workshops" (see lesson unit 1) Robert Jungk enumerates five central utopian tasks:

1. "The invention of new social institutions.
2. The invention of non-violent methods of bringing about social, political and economic changes.
3. The invention of alternative occupations.
4. The invention of new goals and values.
5. The creation of a creative society." (1996, 10).

Didactically interesting is what Jungk calls the phenomenon of the "time prison", our inability to think the unthinkable because of being trapped in and conditioned by customs and culture. Therefore, pedagogical work has to support students to liberate themselves from obstructive ideas that disable social creativity. Other versions of the time prison include mere technical visions to solve present social problems (see lesson unit 3), or the creation of utopia as a harmonious, but paralysing "opium for the people" (see lesson unit 2).

Planning

Political planning refers to the binding selection of one solution from several possible choices of action. If utopian ideas and social inventions are involved, we can talk about an (rarely found) innovative, experimental society. Each planning process inevitably results in a double practice- or reality-shock. First, psychological, political, technical and financial obstructions prevent us from putting more than compromise versions of our social dreams into practice. Secondly, even humane social innovations can have unintended inhumane outcomes. The transformation of the

socialist utopia into a totalitarian state system represents the most prominent example, having led to a discourse about the alleged "end of history" (Fukuyama) which in its turn gave rise to disenchantments with the utopian idea itself.

The concept "future" elucidates the political circle of problem solving: Prognosis names possible problems, utopia designs possible solutions which planning puts into practice by creating, in the long run, new problems.

II Variations of the Genetic Principle as Approaches to Politics

1 The Individual Genesis: The Political Self in the Future Workshop

Our examination starts with the future workshop (see lesson unit 1) because its three phases embody the whole problem-solving process of the concept future. Future workshops are an established democratic procedure outside parliament able to create political concepts and successful projects even out of vague criticism and nebulous wishes. Especially those groups which already have a common concern find in it a useful method to invent new social institutions - like the discontented German bankers who developed and founded the first German ecological savings bank (Öko-Bank).

At school, this common concern must be engendered, starting with the concerns each individual brings along (see Grammes, search strategy "biography"). Stimulated in the phaseof criticism to research their own future fantasies (see lesson unit 2), they quickly discover the dialectics between their fears (negative prognosis) and their utopian wishes (here: private retreat into an idyllic rural life). A 14 year-old re-flects afterwards:

"For the pictures about 'my life', they all tried to paint life in the most beautiful colours, with many friends and so on. In the pictures about 'the world', all the negative aspects are brought out, full of smoke and waste gas. (...) I think most of us painted very negatively how they imagined the world and didn't think about themselves, how they could manage living in such an environment." (Thurn 1999, 208).

This experienced discrepancy can be an important trigger to discover and work on the connection between prediction, utopia and planning: Are our fears really true? Do our utopias really help us to solve the problems we see approaching? How can we accomplish our (probably contradictory and inconsistent) utopias? Which other utopias are conceivable? How can we, considering apparent obstacles, put them into practice?

Older adolescents or adults, on the other hand, are less easily caught up in possible negative futures, being more used to suppressing or integrating their fears in favour of their every day tasks. So, with university students, I realized a future workshop ("Zukunftswerkstatt") about the open question "The future of our society, or how do we want to live tomorrow?" and asked them to find a future topic to which they could relate (see Petrik 2002b). Conditioned to criticize as they were asked to do in the first phase, they more likely "jumped" (Jungk) into the future only during the utopia phase, where they outlined and played out futurist scenes and tried to investigate

their chances and problems. In this manner, we were introduced to future producers of clothes who could not imagine at all how "tailors 250 years ago could sew their names onto their coats and shoes, making kids fight and steal to get them, and emaciated women get cheered on catwalks".

Present problems become more clear and visible if we "look back" at them from a future period, where they appear to be solved. Martin Wagenschein worked a lot with alienation effects like this one. He enlarged, reduced, distorted obvious daily and therefore easily overlooked phenomena to bring them back into the learner's attention. In the case of utopian ideas, the object's genesis does not appear in the form of its past, but in the context of its possible future development: Oh, the present could be much different, there are other possibilities!

Finally, during the implementation phase, all utopian ideas get seriously scrutinized for political, psychological and other obstacles, chances and available realisations, to prevent them from remaining mere dream worlds.

Future workshops support mainly the individual genesis of a political identity, as students themselves are treated as "social exemplars", as authentic representatives of recent culture. Their fears and yearnings, their values and political ideas form the subject matter. Being confronted with their own time prison and the controversial ideas of other students, they undergo a learning process that at the same time strengthens their sense of political imagination and political reality. In addition, future workshops work with scientific and spontaneous geneses and demonstrate that social inventions are necessary, methodically possible and politically difficult to put into practice.

2 The Scientific Genesis: On the Track of Futurology

Using extracts of predictions, our first future workshop already shows scientific approaches (see lesson unit 1). Still, the mere quantity of future trends enhances the risk of superficial pseudo-knowledge because of lack of a clear connection or just one exemplary topic.

Jürgen Henningsen's(2) lesson unit, by contrast, combines several predictions dramaturgically: Starting with the most urgent and distant problem (population development and nutrition), he introduces political solution plans that lead to recent political questions concerning his students' everyday life (housing, communication, means of locomotion). Finally, as a "knot in the central thread", he dis-cusses the historically changing role of human beings as creators of the future. The genesis of the future becomes visible by temporal, spatial and "modelled" comparisons: Daily average amounts of food today (1967) and in 2000; the different perception of speed in three historic periods, communication methods today and in ancient Greece; historic changes within the locality; chain reactions and mousetraps, computer and simple thought machine, Big Brother and the own future.

The role of futurology to diagnose problems and suggest solutions through the help of historic comparison and extrapolation becomes quite

intelligible. On the other hand, since the lessons don't question by whom and how certain predictions have been developed, critical predictions about the problematic potential of the suggested technical solutions are missing: Many of them (atomic power, dams, industrial farming) are today's unsolved problems. According to Robert Jungk, the time prison can be made conscious by comparing the present not only with historical events but also with historical predictions, realized and failed human dreams. Like this, technical imagination would be enriched by social imagination (see II.4).

The scenario technique (lesson unit 4) enables students to create their own predictions and therefore to regard professional ones more critically. Future crystallizes as a complex system whose social outcomes have to be considered as well. Opposite extreme scenarios visualize possible unintended outcomes (time traps). Political planning appears as a necessary steering wheel.

However, to serve as exemplar with the potential to make students discover the social necessity of scientific predictions, the topic "automobile" should be presented as an ambivalent human dream: If the excitement that cars provide is left out, students will easily morally condemn its destructive consequences without really meaning it (double talk). The genesis of modern traffic should be shown as a solution to the great historic promise of speed, power, independence and connection to distant areas that only became a problem when too many people became attracted to it. Futurologist questions would easily arise at this point: "What does the future of the automobile look like?" "Which methods allow to investigate it?"

Working with scientific geneses could also mean dealing with the motives for founding, and the typical contents and methods of well-known think tanks like the RAND Corporation or the Club of Rome (see also II.4.).

3 The (Spontaneous) Institutional Genesis: Getting Caught up by Simulated Realities

The fishermen's game (lesson unit 5) is the only one of our lesson units that is able to involve students immediately without having large amounts of factual knowledge regarding an eco-social dilemma. They experience the logic of failure and struggle for fundamental political solutions. The lake as eco-social microcosm demonstrates how we can condense complex realities to be able to make them understood (see Geuting 1992, 51 ff.). Simulations and environmental and social models are necessary and established methods in the social sciences since its objects have become less and less open to sensual experience (see Wilhelm 1967, 287 f. and Grammes, search strategy "embryonic society" Simulations are themselves an authentic approach to human culture, they are - like movies and theatre plays - able to provoke the illusion of reality although its fictional character remains conscious. The fishermen's scenario as a primeval situation of human history is easy to imagine, well-known and, at the same time, foreign enough to allow students to experience themselves in an unusual,

"alienated" context. Additionally, the living conditions of the fishermen's families might be discovered by a "fantasy trip". The lake could be visualized by a plastic swimming pool filled with wine corks that get fished during every round. "Money" could be paid to the fishermen and an environmental authority might announce the regeneration of the fish.

But even the paper and computer versions of this game used in psychological laboratories generate serious situations where test persons blame and emotionally attack one another for being responsible for the resource disaster (see Ernst 1997, 31). The problem occurs "spontaneously" and is very much "present", because the players created it themselves and therefore are motivated to search for solutions. The importance of institutional settings becomes clear: settings that require regular meetings and negotiations with clear rules.

By comparison, real complex social or environmental problems need much more time to be deeply understood, let alone to find possible solutions. Once understood by the help of a model, conceptual insights help to make real case studies more easily accessible. The German "father of political education", Eduard Spranger, sketched this didactic trilogy already in the sixties: First we should work out "basic political phenomena" (like the fight for limited resources), which we secondly simplify by constructing "mental models". Finally, we can compare these models with "historical realities" (1963, 56).(3)

4 The (Personalized) Historical Genesis: Quick Visits to Eras of Upheaval

Historical key situations can be tracked down by following the genesis of social innovations which are established social inventions (see also Grammes, search strategy "historical inventions"). An important social innovation is the future workshop (see unit 1) that has been invented by the Austrian Robert Jungk (1913-1994), political journalist and "organising force of the supra-national futurologist's movement" (Alvin Toffler). His life and work can be described as a huge future workshop:

Phase of criticism: Crucial experiences like bomb-shattered Berlin and interviews with people in Hiroshima suffering from radiation sickness ("Children of the Ashes. The Story of a Rebirth", 1959, Engl. 1961) make him realize the long term and irreversible effects of politics (his future shock). To find out who prepares in which way what kind of future, he travels to several think tanks in the USA ("Tomorrow is already here", 1952/1954) and does research on the history of the atomic bomb up to the anti-nuclear movement ("Brighter than a Thousand Suns", 1956/1958) as a primeval example of a politically-promoted high-risk technology and the ensuing social counter-reactions. He systematizes early criticism of the risk society by gathering noted futurologists who confront military and technical predictions (and plans) with social predictions, for example during the first future research conference ("Mankind 2000", 1969/1969).

Utopia phase: According to Jungk, the anti-nuclear movement of the 1950's "gets stuck in their criticism". Therefore, he examines the historical transformations of utopian visions ("Menschheit-sträume. Visionen

verändern die Wirklichkeit", 1969 [Dreams of Mankind. Visions change Reality]) and collects concrete utopias about key social spheres ("The Everyman Project. Resources for a humane Future", 1973/1976). In all, he edits ten volumes of "Models for a new World".

Implementation phase: He founds the "Institut für Zukunftsfragen" (Institute for Future Matters) in Vienna (1964) and experiments on first future workshops, not yet succeeding in evoking the workers' and employees' social imagination: They remain silent or just "parrot" economic and political slogans (his reality shock). Henceforth he is looking for existing methods to overcome the time prison (e.g. in theatrical education and American creativity research). In 1974/75, a future workshop helps the residents of the German mining village of Eisenheim to suggest creative solutions to prevent their homes from being torn down (see Jungk 1996, 27 ff.). Later, Jungk analyses parallels in the military and civil use of nuclear power ("The Nuclear State", 1977/1979) and gets active in the anti-nuclear power movement. He gathers examples of social inventions and innovations ("Katalog der Hoffnung", 1990 [Catalogue of Hope]) and runs (unsuccessfully) for Austrian President for the Green Party.

Jungk's work is rich in didactic stimulations: He teaches us which phenomena can initiate a consciousness of the future, how we can study the future, that it is important and possible to take a chance to develop social ideas and to try to integrate them in the political process. He acts genetically by visiting and suspensefully describing the "birthplaces" of risky, desirable and successfully implemented futures. His suspenseful report "Brighter than a Thousand Suns", for example, already represents a "collective learning event" - since the history of the nuclear bomb can be regarded as exemplary for the genesis of the risk society as a whole. But using it as a "didactic play" (Lehrstück) at school would be more appropriate for history classes than for civics considering the necessary knowledge about the politics of the past.

Alternatively, we can use Robert Jungk himself as central thread, as an exemplar for the complex interaction between governmental future politics and non-governmental political reactions. Without its inventor, the historical importance of the future workshop method as a "grassroots democracy think-tank" would remain in the dark. The Lehrkunst-paradigm of the "authentic cultural representative" is not meant as a personality cult, but will initiate an "original encounter" with persons who could establish something that appears still unknown or too ordinary to us: The "human side" of the object is supposed to disclose it more "intimately", "the creative moment that touched and touches off the encounter between human being and object" (Roth 1965, 110, 116).

A condensed time travel through excerpts of his work and biography would allow insights into formative islands of the future's past and lead us from the early atomic scientists in the 30's to the 90's of the 20th century. Interestingly enough, Jungk himself suggests a similar didactic setting to dive even deeper into the future's history. Eras of upheaval, which frequently occurred at the end of centuries (Jungk refers to Schwartz 1990), are supposed to stimulate the student's creativity:

"So starting for example with Columbus in 1492, the French Revolution in 1789, Freud, Einstein, at the end of the 19th century, etc. you understand,

to imagine oneself back to each last ten years of these centuries and their consequences, to recognize that each period doesn't only bring about distress but also creative chances. (...) So to speak, to turn the crises, especially those from which the students suffer, for the better, saying: Great! (...) Your future isn't safe, but just because of this you have creative chances." (Jungk 1997, 103 f.)

Brief visits to key historical moments to outline central threads of development are both a difficult (danger of superficiality) and necessary challenge for genetic didactics. Watching "slides" with future images from different eras (see unit 6) or comparing historical utopias to recent topics (see unit 7) could drag students into the future's genesis, as Wagenschein demonstrates for the history of the earth:

"Without saying anything and without being in a hurry, I showed lots of slides (...): Screes, avalanches, glaciers, moraines, valleys, waterfalls, rugged coasts, deltas and so on; in fact all mixed up. The students could comment on that whatever occurred to them, and also ask questions that I didn't answer. After some time all questions converged to one, comprehensive question, concerning all images, a question that didn't look into the past but into the future: 'How will this be ending? Everything goes down to the valley. Will there be an era without mountains?'" (Wagenschein 1991, 80 f.)

5 Outlook: Social Sciences Didactics Searching for Exemplars

What is the outcome of our best practice workshop? Basically, working on teaching units made it easier for us to transfer didactical categories to the concrete arrangement of learning processes. Regarding subject matters as scientific and cultural concepts helped us to compare them with the learner's everyday concepts, to track down thematic gaps (e.g. "social imagination" in Henningsen's unit) and to sketch a thematic focus for complex and extensive topics (e.g. Jungk and the risk society). The genetic method provided us with learning arrangements making it possible to experience politics as a creative process.

Table 3. Genetic approaches to the concept future

Genesis	**Exemplars**
1. Individual genesis	Social fears, dreams and plans in the future workshop
2. Scientific genesis and genesis of ideas	Central threads of historical predictions and utopias, history of think tanks, Scenario Technique as a procedure of diagnosis, Future Workshop as instrument of invention
3. (Spontaneous)	Fishermen's game as eco-social microcosm

institutional genesis	
4. Historical genesis	Robert Jungk and the birth of the risk society
5. Human genesis	Images of the future throughout history

At the first sight, the didactic principle of actuality seems to contradict a genetic teaching of history, since historic key events (French Revolution, development of the atomic bomb) or social key inventions (parliament, welfare state, scientific prognostic) are within the range of the history curriculum. Nevertheless, civics classes can take quick tours to historical turning points or encounter scientists or cultural activists that lead them to our presence and future and help to answer today's questions (see also Leps). Still, the foundation of the BRD and the DDR in 1949, the student's revolt of 1968, the breakdown of socialism in 1989 and September 11th, 2001 are relatively young key political events that should be reserved for civic education.

The spontaneous institutional genesis solved the problem of exchangeable political conflicts: Models and simulations of social reality abstain from recent cases, entangle students in paradigmatic problems to develop their own solutions and give insight into the connection between politics, policy and polity.

Finally, working with the individual genesis of the students' political ideas can both strengthen their political identity and moderate their disenchantment with politics: Their own difficulties to reach useful compromises with other adolescents demonstrate the characteristics of politics which result in criticisable outcomes: Apart from corruption and inability those are due to the complicated and hard task to coordinate most different interests.

I wish the participants to be successful with these teaching units and not to get a too big reality shock.

Notes

(1) A few short but basic publications of Wagenschein and Roth have been translated into English, see Westbury, Hopmann, Riquarts 2000.

(2) Jürgen Henningsen (1933-1983) was an unconventional scholar of education who designed, taught and analysed this lesson unit. His book represents an (even in Germany) overlooked classic didactic work in the field of civic education: literarily high-browed, clearly and precisely written (only 159 pages!) it already combines 1968 didactic theory with teaching practice.

(3) Spranger develops his genetic theory by the presentation of the example of a thousand people emigrating to a derserted island, starting a new life and discovering the basic political institutions and procedures (see

Grammes, search strategy "Robinson-stories"). In my doctoral thesis I further develop this approach, extending the model "island" and adding the individual genesis to this institutional one: Students settle down in a deserted village, negotiate their political ideas and compare with those of Adam Smith, Edmund Burke, Karl Marx and Pierre Joseph Proudhon as representatives of basic political orientations (see Petrik 2003 and 2004; homepage).

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