



Technology Perceptions from the Antique to Post-industrialism

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Spring Term 2003

Some ways of looking at technology



Extrinsically: society-technology relationship is seen as historical phenomenon. Changes of the socio-cultural structure are explained by showing the development and implementation of different types of technology such as agriculture or mass production.

Intrinsically: These authors focus on the conditions of technology such as human knowledge and the ability to design and produce and look at the results. (Gehlen)

Intrinsic and extrinsic approaches are able to show mechanisms of social and technological interactions, but many lack a sufficient reasoning for the implicit assumed mutuality of both.

Thus we want to argue methodologically (typologically) for the interdependence of social and technological performances.

We employ the idea of an action context and discuss changes within four time spans: the Antique, the Enlightenment, the Industrial Revolution and Post-industrialism.

Action context



Represented by the Aristotelian constellation of three different activity types and their intellectual potentials:

- recognition (theoria with its potential sophia),
- morality (praxis with its potential phronesis) and
- production (poesis with its potential techné).

The intention is not look on technology in form of artefacts or processes and how they altered human life but to regard it as the action type "poesis", which is interdependent with "theoria" and "praxis".

We will further argue that the activity types evolutionally changed their importance within the different time spans. Related to the other types one could label the role of technology in the Antique as **marginal**, during the Scientific Revolution as **surpassing** and in the Industrial Revolution as **fundamental**.

Despite the essential role of technology in Post-industrialism, some concepts aim today towards a balance of actions types (**parietal**), e.g. sustainable development and industrial ecology.

Modes of Activity



The three fundamental modes of activity [energeiai] in Aristotle's description are: theoria, poiesis and praxis.

These correspond to three natural potentialities [dynamis] of the soul, or dispositions [hexeis]: respectively sophia (which unites epistémé, wisdom and nous, knowledge), téchné, and phronésis.

The Aristotelian trinity of the True, the Good and the Beautiful appears in all domains recognition (theoria), moral action (praxis) and production (poesis), whereas the theoria as contemplative comprehension of the eternal truth possesses most value, followed by praxis as individual and collective moral action and poesis as production.

Human representatives of the domains are the philosopher, the politician and the economist / technologist.

Theoria



Theoria with its intellectual virtue sophia means originally "observing" ("theorein"), it is later used as "mental regarding, recognizing".

For Aristotle is theoria the study of the truth. The study of the truth is called theoretically, because it is uninfluenced of practical purposes, use and interests.

The happiest life is lived by someone who has a full understanding of the basic causal principles that govern the operation of the universe, and who has the resources needed for living a life devoted to the exercise of that understanding. It is the life of a philosopher.

Praxis



In conventional Greek usage praxis means a doing, an acting or action. Aristotle uses 'praxis' and the cognate verb 'prattein' broadly for all intentional actions. More strictly, praxis is confined to rational action on a decision. Most strictly of all, praxis is confined to rational action which is its own end, and is not done exclusively for the sake of some end beyond it.

The realm of praxis is the "polis" (the public); its issues are morality, self-legislation, and participatory democracy. Praxis as activity type comprises a goal in itself (e.g. in form of justice, modesty, compassion), its performance constitutes and express itself in the good life.

Although Aristotle argues for the superiority of the philosophical life in the Nicomachean Ethics (X.7-8), he says in the final chapter, that his project is not yet complete, because we can make human beings virtuous, or good even to some small degree, only if we undertake a study of the art of legislation.

Human beings cannot achieve happiness, unless they live in communities that foster good habits and provide the basic equipment of a well-lived life.

Poesis



In poesis with its virtue techne we can retrieve the concepts technology and poetry. For example the poetics of Aristotle can be seen as a catalogue of literary techniques.

Poesis has its purpose outside; the poetical activity is focused on a product or an effect (Nicom.Ethics 1140b5-7). Artificial production happens in the oikos (household) and is considered as profane, as a matter to provide the necessities for life as the basis for the moral and theoretical development.

Technology completes what nature leaves imperfect according to our human purposes.

There is however an ontological gap between natural things and artefacts such that technology cannot reproduce or change natural things. ("When the farmer leaves his field it will continue to grow, when the carpenter leaves his table it won't")

The relationship between the three activities



Theoria and praxis supply each other. A theoretical discourse implies already certain practical rules such as respect and mutual tolerance in a literal way.

Practical wisdom on the other hand does not consist in a simple set of moral rules or maxims, a list of truths which can be learned and then applied to experience. It consists rather in an ability to do the right thing in a wide variety of different circumstances.

Besides the grant of essential supplies for living, poesis has no essential meaning for theoria and praxis (**marginal role**), science is defined as nature recognition with and lacks completely of experimental verification or any apparatus, which was considered as disturbing the workings of nature in its own free productivity and not at all conducive to theoretical insight.

The Scientific Revolution



Theoria and Praxis

The idea that the laws of nature are discoverable by means of reason gives way to scientific observation. The power of observation and reasoning can be trained by learning mathematics (arithmetic, algebra, geometry) and logic, by carefully recording and checking our observations, and by doing experiments.

Phenomenon of increasing scientific knowledge and decreasing faith. To connect the emerging natural science (now "theoria") and theology (now "praxis") a natural theology or physic-theology is established.

This concept explains natural phenomena (observation and experimenting with nature) as physical manifestation of the divine spirit (praxis, since god represents all moral laws), where every part has its meaningful place and stands in an order, expressed and comprehensible for humans by the natural law.

Theoria and Poesis



The scientific revolution regarded the consequences of technology on humans mostly as improvements of human living conditions on earth. Bacon believed for example that an extensive process of 'artificialization' ("poesis" as e.g. inventions), could banish death and take us back to Eden, with the knowledge and status of Adam in Paradise. Knowledge should help prevent and relive hunger, diseases, need and natural catastrophes. In this view science was about producing wanted effects, and the basic notion was its usefulness.

The title page of "Novum Organum" shows a ship passing through the Pillars of Hercules. The Pillars of Hercules were generally accepted to have stood on the sides of the Strait of Gibraltar, the sole passage between the Mediterranean Sea and the Atlantic Ocean. For the ancients, the Pillars of Hercules symbolized the limits of human's possible explorations. Beyond the pillars lay the edge of the earth; the ancients had not been inclined to progress into those outer reaches and leave the old world behind. Now it seemed possible to pass through via scientific knowledge.



Poesis and Praxis



While in the medieval Catholicism all fate and decision was in Gods hand, and thus "praxis" meant to follow His orders, the Protestantism contributed significantly to a dynamic push towards emancipation by promoting that work that is directed at practical utility is part of Gods will. This also facilitated the development of a *rational* type of control by the state expressed e.g. in Hobbes philosophy, which replaced Aristotle's "zoon politikon" society and the medieval "Civitas dei".

Poesis was not only coupled with theoria via the experimental apparatus (the term of "practice" as applied science which we know today derives from this connection), it was legitimized as a part of "praxis" as well by the implications of Protestantism.

The change of constellation shows the importance poesis gets for theoria (as new natural science) and praxis (as new protestant ethic). Thus, we think the role of poesis in this area can be labeled as **surpassing** i.e. a technologisation of the other activities began to emerge.

The Industrial Revolution



The main feature of the Industrial Revolution is the application of power-driven machinery to manufacturing. By the beginning of the 18th century the use of machines in manufacturing was already widespread in England. Scientific technology and industrial production began to flourish. Spinning machines, steamships electricity and railroads were invented.

The Industrial Revolution brought with it an increase in population and urbanization, as well as new social classes. In addition to a new factory-owning bourgeoisie, a new working class appeared which included men, women, and children labouring in the textile mills, pottery works, and mines. This implied profound social changes, as Europe moved from a primarily agricultural and rural economy to a capitalist and urban economy, from a household, family-based economy to an industry-based economy. By mid-nineteenth century, half of the English people lived in cities, and by the end of the century, the same was true of other European countries.

The fundamental role of Poesis:

1. Legitimation via Praxis



According to Max Weber the Protestant ethic was one cause for the Industrial Revolution with its emphasis on the meaningfulness and dignity of labour.

In the "The protestant ethic and the spirit of capitalism" he argues that after the reformation, Protestants lost the ability to change the destiny of their soul through means of indulgences, confession, communion, baptism, or advice from a priest who was now no more closely in touch with God than the average man.

Consequently, work is the only available option for convincing oneself that they shall be saved. The toil that had allowed early Protestants to appease their restless souls is later forced upon all of humanity. To Weber, the Protestant will continue to work in order to put his mind at rest, all others will have to follow suit or starve (p. 68). Eventually, all religious peoples and even atheists must acquire this Protestant ethic or perish as well. Further along, wealth will be accumulated to the extent that the asceticism that allowed for the surplus of capital that allowed for industrialization will be lost to the newfound idolatry of the flesh and luxury, and the need for religion will vanish accordingly (p. 175).

However, after the ethics of Protestantism has vanished, the external strength of the "iron cage" of capitalism created by it will remain (page 181), causing human to abandon hopes of finding cultural or spiritual justification for his position in life (p. 182).



Businessman in league with the devil

11th January 1861

2. Theoria and Poesis: united



Even if revolutionaries of mind, such as Kant, insisted on the distinction between theoretical and practical reason and thus, in a way, preserved the Aristotelian theoria, the Industrial Revolution left fundamental theoretical research, the natural sciences methods and technological application inherently tied.

Moreover, due to the enormous mass of empirical data to be collected and examined, the way to proceed developed by the natural sciences did not reduce itself simply to a system of calculation, but became a pervasive cultural and linguistic model, to the point of invading the entire landscape of the human sciences.

The idea that beneath the appearances of reality a "geometric scheme" which unites all wisdom can be found generated the unfeasible belief that "the right method" would make it possible to predict and predetermine the behaviour of man and nature.

Post – Industrialism



Phenomena are e.g. **human alienation** from the socio-economic context and the **environmental crisis**.

Alienation: Marx argued that fabric labour has a devastating effect on the lives of individuals. Commodities are produced by mixing workers labour with natural resources to make new, composite things that have greater economic value.

Thus, the labour itself is objectified, its worth turned into an ordinary thing that can be bought and sold on the open market, a mere commodity. The labour now exists in a form entirely external to the worker, separated forever from the human being whose very life it once was.

This is the root of what Marx called alienation, a destructive feature of industrial life. Alienation means not only separation from one's own nature but also from social reality and often results in an indifference or phlegm.

Marx pointed out that workers are alienated in several distinct ways: from their products as externalized objects existing independently of their makers; from the natural world out of which the raw material of these products has been appropriated; from their own labour, which becomes a grudging necessity instead of a worthwhile activity; and from each other as the consumers of the composite products. These conditions are the invariable consequences of industrial society.

The environmental crisis



The contradictions generated by the dynamics between natural reproduction, industrial production and public consumption are one reason for the ecological crisis of the late twentieth century.

However, it is not only economic interests that hinders effective actions, but the difficulty that these would require a profound change in today's pattern of living, which are expressed in the dynamic of the market economy, in the consequent urban concentration, in the consumption culture, shortly, which are the upshots of the Industrial Revolution.

On the other hand, there is an increasing public awareness that human actions can cause a global disaster, more and more individuals feel uncomfortable with the damages of environment, suffer physically from the consequences or are discontent with traditional industrial and social routines.

What's new?



This opens the possibility for a new constellation change of theoría, praxis and poesis towards a moral **parietal** relationship.

Concepts such as Sustainable Development and Industrial Ecology are able to reflect on this option. Here it is helpful to abandon firstly the idea of an universal scientific method existing for all disciplines and the belief that technology is neutral and autonomous in its development (technology determinism).

Secondly, they have to recognize that the grand design of an average, homogenous, one-dimensional man, oriented solely towards undifferentiated production and consumption and denying his own individuality and unique way of organizing himself is obsolete.

Finally, this has to be reflected methodologically in these concepts by integrating different disciplines into research programmes and projects.

