

Effective warning and adequate response. Practical and logical conditions of improvement
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In the beginning of disaster research, stage-models have been useful in identifying and analyzing characteristic patterns of temporal, spacial and behavioral sequences. Today, however, the progress of Technologies and Sciences made the theoretical and methodological deficiencies of stage-models obvious but also their lasting descriptive and heuristic value.

The utmost beneficial effect of stage models was the modelling itself. All attempts to divide the process of disaster into specific sequences brought the knowledge home to scientists that time and space become the most influential variables when people try to cope with disasters. The loss of sovereignty of time is equivalent to pressure: Without the chance to weigh one's alternatives rationally, deciding is at random and therefore far below optimum. The loss of sovereignty of space is equivalent to narrowness: Without the chance to keep distance from danger and threat, fear ("Angst") is taking command and makes people literally feel trapped and driven into a corner.

In terms of decision-making theory, this is known as "deciding under stress". But it is not only the lack of time and space which makes people stressed, it is also the lack of information. Although (tolerably) incomplete information is normal in every-day life, under stress incomplete information is diminishing time and space in particular. Conversely, complete information may enlarge time and space because intellectual sovereignty procures internal (emotional, psychological) distance and instantaneous readiness (of mind and body). Thus, information is a "functional equivalent" of time and space.

Proportional to the onrush of danger, the speed of getting ready and prepared makes the disaster: Is the danger faster than any protection, wreckage is unavoidable; is readiness as fast as the onset of danger, withstanding is propitious; and is readiness faster than the onset of danger, even precautionary measures are to utilize. Hence, disaster can be defined as result of interfering periods of time, or, in other words, as proportion of correlating speeds: the speed which people need to analyze their situation is the first factor that determines the rapidity of an upcoming danger. Stunned people "accelerate" the onset of danger; fast reactions "decelerate" the onset of danger. Consequently, threats have no speed of its own, no absolute, unevadable velocity. Thus, it is the human reaction to risk and danger that makes the choice out of the spectrum from total failure to total safety.

Analyzing the meaning of "velocity of threat", different physical conditions of metamorphosis are to distinguish: a danger in the state of risk is only a latent, a likely damage which threatens those who fear this risk. Anew, the turn from risk to danger is the turn from latency/potentiality to manifestation, but this is not necessarily identical with damage, although risk is defined by the range and likelihood of damages. In fact, the turn towards damage is determined by specific conditions

(amount of energy, involved substances and materials, constructive and architectonic standards, location, weather a.s.o.) and lasts a correspondent period of time. During this time, adequate responses beguile the metamorphosis from risk to damage and that is the minimization of risk afterwards.

Here, then, two completions have to be made. The one is dealing with human response to risk and danger, the other with the minimization of risk. Risks, as the above has shown, can be minimized afterwards - through adequate response - and beforehand. In praxis, the latter is based upon the former: Without any idea of possible dangers and failures, the conceptualization of "risk" is impossible, too. Historically, the concept of risk has been accrued from (grievous) experiences, because it was the error and not the success that demanded remedy and durable betterment. Generally speaking, remedial measures and betterments are surmounted failures, which have been incorporated into material culture (better techniques, solid machinery, safer plants) and into knowledge. Again, information is the functional equivalent to risk-reduction.

Now, the sequences of stage-models come into the play again. The so-called "pre-disaster conditions" (see Powell 1954) are pretty much the same what is called "impact". The impact-phase, as Powell puts it, is characterized by some sort of inventory, an immediate diagnosis of the situation after the impact. The pre-disaster conditions, however, are characterized by the set of individual and cultural capabilities which are necessary to cope appropriately with the effects of potential disasters. Transformed into "information", both phases signify the same, regardless of time and space.

Taking time and space into consideration, the asynchronism of "pre-disaster conditions" and "impact" becomes as obvious as the urgency to synchronize the specific information of both phases in case of emergency. To withstand and survive threatening events, relevant information of both phases are indispensable, because stereotypes like "Keep calm!", "Don't panic!" are absolutely meaningless. Alike the cacophony of the wilderness that scares city-dwellers almost to death when they sleep the first time in their lives under the open sky, the "codes" of modern risks have to be explained and understood as well as the meaning of the sounds of wilderness. It is this information that helps to keep mind and body, fear and "angst", under control. While utilizing these information people fall back upon the stockpile of cultural knowledge which was accumulated in the past and which is built of the experiences of the threats humankind has survived before. If we might be able to watch ourselves simultaneously in slow- and quick-motion, the stockpile of accumulated experience appears as (historical) sequence of emergencies along with solutions and the actual emergency appears as extended crosschecking of the situation's requirements and a fitting solution out of the historical reservoir. Thus, the chance to survive an emergency depends on the length of time to dispose of the information which enable a person to do a correct diagnosis of the situation and an appropriate therapy, i.e. an adequate response (rescue and remedy).

The sequence of warning has to be reconsidered now. In former days, a few danger-signals might have been sufficient to alarm one's company. Today, the danger-signals of sirens or other technical warning-systems are neither instructive nor fast enough. Yet, not the warning-systems are to blame but those who need to be warned. Analogical to threats, which have no speed of its own, no absolute velocity, also warnings have no absolute velocity and no significance in its own. The speed of warning depends on the cultural standard of alertness; and the significance of signals depends on the

risk-perception and the risk-taking behavior of all people. Therefore, warning-signals need a specific receptivity, an auditory which is instantly and autonomously capable to interpret the contextual meaning of signals. Consequently, it is not the warning-system that has to be expanded with more detailed information but those who have to utilize the warning. The individual's capability to cope with emergencies by synchronizing different information needs a corresponding capability on the level of daily risk-handling: Only a rational risk-assessment and an appropriate stockpile of knowledge and protection-measures led to a permanent alertness and an operative preparedness. Both is the precondition to realize warning-signals and to survive disasters.