

Research into Changes in Brain Formation

Michael Kneissle

*Reprinted from the Spring/Summer Newsletter of the Waldorf Steiner Kindergarten in Great Britain.
Forwarded to the Newsletter by Erika Grantham.*

About twenty years ago, the first evidence came to light showing that something unusual was happening to our brains. Scientists discovered a surprising phenomenon while they were investigating the processing of stimuli and the emotions of Germans. 4000 test subjects had participated in a series of bio-psychological tests stretching over a period of many years. After the conclusion of the experiments, it was discovered that the tested people were no longer able to use their senses of smell and taste as well they could at the beginning of the project.

“The receptivity of the senses of smell and taste had degenerated significantly,” according to Henner Ertel, a psychologist from Munich. “The brain had set a new sensation threshold, so to speak, and had refused to recognize sensations that were below this new limit, sensations that would have been unconditionally accepted before.”

The scientists noted this unusual state of affairs very carefully back then, but were not unduly concerned. The changes had been minimal. Only the two senses that were the oldest from an evolutionary standpoint had been affected. The important senses of sight and hearing were unchanged.

However, at the beginning of the Eighties, there was a dramatic development. Henner Ertel expressed his amazement in this way: “Suddenly all of the senses were impaired. The brain refused to take any action on a significant proportion of the stimuli. It was getting more and more difficult to stimulate the corresponding centers in the cerebral cortex.”

The researchers were not alarmed. The organization of the brain had apparently changed. In order to get a reaction now, they had to use barrages of action potential, which only a few years before would have caused a shock.

Since then, the trend has accelerated. Our sensitivity to stimuli is decreasing at a rate of about 1% per year. Delicate sensations are simply being filtered out of our consciousness. This makes room for a multitude of brutal “thrills,” as the especially strong stimuli are called.

At the same time, the brain seems to have made significant alterations to its internal strategy. “There are many indications that these new brutal stimuli are being processed in a different way than before,” says the psycho-physiologist, Dr. Harald Rau of the Institute of Medical Psychology at the University of Tuebingen. This institute is among the most well-respected research bodies in the world for behavioral neuro-biology. Harald Rau says, “It is apparent that the cross-linkages (networks) have been reduced, and that the capacity has been enormously increased using direct stimulus carriers working parallel to each other.”

Ertel explains this, “Previously, an optical stimulus would be directed through various brain centers and would also activate the olfactory center for example. Today it appears that entire brain areas are being skipped over. The optical stimulus goes directly and exclusively to the visual center.”

This technique has the advantage that the other areas of the cerebral cortex are left free to process specific stimuli, and at the same time the optical stimulus reaches its goal at high speed. The disadvantage of this

process is, however, that the stimulus is not or is only inadequately networked and enhanced with emotions.

This has serious consequences. Studies carried out by the Rational Psychology Association (Gesellschaft für Rationelle, Psychologie, GRP) in Munich show that optical information is processed by the “new” brain without being evaluated. When adults are shown the so-called Flesher videos, in which people are torn apart, their legs ripped out, etc., they experience, repulsion and revulsion. Most refuse to watch the film through to the end. However, most children do not have this problem. They only watch without emotion and only pay attention to whether or not the drama and plot are exciting. If yes, they continue to watch, if not, they go on to something else. That’s it.

The studies done by GRP revealed a kind of generation gap with respect to the change of consciousness. The generations are pegged more or less to the years 1949 and 1969. Whoever was born before 1949 seems to have an “old” brain. Whoever was born between 1949 and 1969 has a modified old brain. And whoever was born after 1969 has a new brain.

The basic structural plan of the brain is the same for all generations: 20 billion cells of grey matter. More switching combinations than stars in the universe, more memory capacity than the largest computer in the world. 100 million bits of input per second. 100 million decisions every second.

The Rational Psychology Association in Munich has specialized in the measurement of stimulus processing and brain organization for more than 20 years. Every five years, a test group of 4000 people are confronted with sense stimuli in a standardized test situation. The experimenters from GRP measure the following psycho-physiological data among others: heart-lung rhythm; muscle tension; Wood pressure; blood pressure; blood volume; skin resistance; brain waves; pupil changes. Using complicated calculation models and the individual data, averages and a so-called stimulation-index are determined.

The research is usually done during test parties. A group of from eight to twelve people meets in private quarters. GRP’s lab truck parks in front of the house. During the party, the test subjects are hooked up to the measuring equipment.

A back-up procedure is used to verify the test results from the party. A control group is set up with mobile data samplers and independently conducts the psycho-physiologic measurements in predetermined situations (every evening at dinner, for example). The measuring device has a recording capacity of 48 hours. At the end it is picked up and the data is evaluated electronically.

This GRP method is known to have been perfected over a long time. The method has helped determine how the new brain functions. It uses parallel switching to take up and store different stimuli concurrently and independently of each other, as opposed to the “older” brain models. This creates an enhanced tolerance of dissonance. Dissonance means a discord in a process that otherwise would proceed in a harmonious fashion. “The young people,” according to Henner Ertel, “have grown up with contradictions and they can handle them.” Years ago you would have called this capacity a split or division of consciousness. Today, it is the norm.

In the opinion of the researchers, whoever does not have this capacity will not be very likely to survive in the next millennium. They will break apart under the contradictions that will be delivered over the new electronic media without interruption by the global information network. People whose brain has not adapted to the new situation will drown in the flood of completely non-unifiable stimuli pounding at them from up to 100 different television channels and dozens of radio stations.

If we do not want to go under, we will all have to develop a new capacity, which the trend philosopher, Gert Gerken, called the “new indifference.” He means the mental ability to be able to unite that which is non-unifiable and to meet everything with equal indifference - simply because the brain refuses to bring the contradictory pieces of information into any kind of a relationship with each other. This is the only way that we could be using spray cans and fighting the hole in the ozone layer at the same time. This is the only thing that makes it possible to destroy tons of valuable foodstuffs in the European community while hundreds of thousands of people are starving to death in the famine areas of Africa, South America and Asia.

New “Unconsciousness”

Consciousness is becoming more restricted. The brain is processing more information all the time - and less and less of it is reaching our consciousness.

Conscious	3%	1%
Preconscious	10%	5%
Unconscious	87%	94%

(source: GRP)

Our modern consciousness developed about 10,000 years ago. It is localized in the cortex and gives us our intellect and morals. Since it developed, the brain has always adapted to changes in its environment by changing its own organization.

“But now,” says Ertel, “we are seeing the largest and fastest breakthrough since the dawn of consciousness. Our brain is not adapting. It is rebelling against the world and changing it (i.e., the world) by changing itself. Red is no longer red. Sweet smells begin to stink. In the next century, different people will be living in a new world.” Research results from America and from specialists at the Institute for Medical Psychology at the University of Tuebingen have confirmed this statement just as much as the data from GRP.

Taste, for example: the enjoyment-value-index examines the four basic dimensions of taste: sweet, salty, sour, bitter. The several thousand taste buds on the tongue contain cells which are only sensitive to these characteristics. They fire signals via the nerves to the brain, which puts them together into an experience of enjoyment. Milk, for example, only tastes like milk if the taste is composed like this: 78 to 86 percent sweet, 5 to 9 percent sour, 3 to 6 percent salty, 2 to 4 percent bitter.

The GRP assembled the 18 most important foodstuffs into a food package which is given to the test subjects. It contains bread, potatoes and fish, as well as grapefruit and coffee. All of these basic foodstuffs have been tested with respect to the four basic taste dimensions. This guarantees that, as far as the taste is concerned, the 1993 bread is identical to the bread from 1971, 1976, 1981 and 1986.

If the enjoyment-value changes, it is not due to changes in the ingredients of the foods, but because the brain is interpreting the taste experience in a different way. In fact, it was discovered that the number and intensity of the impulses coming from the taste buds had not diminished. The only thing that has been reduced is the sensitivity of that particular part of the brain.

A base line is determined for each test subject using complicated mathematical manipulations. This base line is the starting point for the series of measurements and is given a value of 100. All values below 100 indicate revulsion. All values above 120 are experienced as enjoyment.

In 1971, the average German enjoyment-value-index was at 154 points, ten years later at 150. Today it has dropped to 143 points. Women are typically 5 points higher than men on average. People over the age of forty show less change than those under forty. Those belonging to the “higher” social circles have a lower enjoyment-value-index than those belonging to the socially lower classes.

Because the enjoyment-value-index is measuring the reaction of the brain to the food in the food package in a direct and representative manner, it is possible to make exact statements about the condition of the German brain. It is clear that nothing tastes as good to us as it did ten years ago. Caviar, champagne, grapefruit, bread - it's all ho-hum and no sensation. The stimulus threshold has moved higher.

The only exceptions to this are the beverages water and beer (+ 10 index points). That is due to the top down effect, a kind of intellectual amplifier. The brain puts a higher value on water because noble mineral waters have built up a positive image. Beer's value to the Germans has increased due to the beer purity regulations.

The GRP checked the results of the enjoyment-value measurements and discovered that the brain must have set new threshold values for each dimension of taste. In order to achieve the same sensation as 15 years ago, the sweet dimension would have to be 1/3, the dimensions salty and sour 44 to 60 percent, and the dimension bitter would have to be twice as high as back then. Otherwise, the brain would not react at all.

Smell, for example: the brain evaluates olfactory experiences completely differently than it did in earlier times. In rural areas, marriage proposals were often made under the stimulating, blossoming chestnut trees. The new brains are repulsed by this smell. The enjoyment-value dropped under 100 in many test subjects.

Hearing, for example: 15 years ago, Germans could distinguish 300,000 sounds. Today on average, they only make it to 180,000. Many children stagnate at 100,000. That is enough for hip hop and rap music, but it is insufficient for the subtleties of a classical symphony.

Aesthetics, for example: the simplest, and probably the oldest geometric figure is the vertical line. It is a lengthened point, which has a neutral aesthetic value. Up until 1986 this figure always reached 106 points on the experience scale. It then dropped to 104. Ertel: “That sounds harmless, but it is not. Absolutely not. When these archetypal qualities change, it is very dramatic and has existential impact. The enjoyment-experience-value-index measures what still gets through to us at all. If it is continually falling, that indicates a restriction of our consciousness. The brain simply shuts out the weaker stimuli. This is normally only the case in emergency situations in nature. But now it seems, the brain is constantly behaving in this way. It is not checking the stimuli any more; it does not build relationships between them. It stores them immediately and conceals them from our consciousness.”

Using all available data, GRP did some extrapolating to try and pinpoint the beginning of this change of consciousness and to map its progress. The computers even took account of other research reports that had been published both by domestic and foreign institutes. “The result is crystal clear,” says Ertel. “It began about 25 years ago, very slowly at first, then faster and faster until by 1982 all sense organs were affected.”

The scientists at the Rational Psychology Association explain the changes to the brain as a result of being overwhelmed by stimuli. They call it the horn-of-plenty effect. The brain is faced with an ever more diverse spectrum of sensations. It experiences the phenomenon of enjoyment maximization: it's always looking for the biggest thrill. The most exotic sense-teasers, the shrillest colors, the loudest noises. This causes the whole co-ordinate system for the ordering of sense impressions to shift. Not too long ago, the

pain threshold for hearing was at about 100 decibels. Today, every disco exceeds this level for power play. The result: the brain begins to accept the loud sounds and ignores the softer ones.

At the same time it also is experiencing the time-lapse-effect: the quality and emotional effect of the sensations changes ever more swiftly. Cult-rock, German Wave, rap, Hip Hop, Acid Rock, Trash Punk. It gets to the point of a flickering of the senses. The brain loses its standards and degenerates into a kind of dialectic processing of sense impressions: it only tries to process the storming waves of sensation. Without any checking /control, it stores opposing and contradictory information without creating a synthesis.

The brain has only changed its organization, not its structure up until now. But the neurophysiologists have already discovered a new phenomenon. They call it plasticity: the brain installs a series of new interfaces and new processing programs. Professor H. Waessle of the Max-Planck-Institute for Brain Research in Frankfurt confirms that different information is processed at different places in the cortex, that the rhythmic patterns are changing, and that the way it is stored is changing. At the same time, the so-called party-effect is getting stronger: that's what makes it possible for you to concentrate on a single conversation partner, while all around you there is tremendous noise and confusion. All other sounds are simply filtered out.

Waessle still has not been able to find any visible changes to the brain with his microscope. But it is only a question of time. Organizational changes always lead to structural changes that multiply very rapidly. Ertel estimates that the new fast brain will have completely established itself by the first half of the next century. Then the future will be in every head.