Mitsuo Ohta, Yoshifumi Fujita

Inter-subjective relationship of higher-order among spatial-temporal wavy environmental factors – a methodological trial based on a standpoint of "Relationism-First"

APPENDIX I

HIGH-TECH POLLUTION-ENVIRONMENTAL PROBLEMS OF WAVE MOTION TYPE

Even in the wave-motion type environmental problem, nowadays, we can see many actual phenomena (with few theory e.g., [1, 2]) composed of extensive environmental factors in different fields with mutual relationship among them. For instance, these examples are given as follows. The nervous system of mankind is so much affected by any field of sound, light and electromagnetic waves in the neighborhood of the specific frequency band from 15 Hz to 20 Hz (because calcium ions are occasionally lost out). This is particularly induced even by the signal modulated into high frequency band with the slow change of its amplitude. Furthermore, the generated order, generated time interval and each of their proper durations between sound and flash of lightning cannot be recognized as it is [3]. There are the biological priority effect between the sense of sight and the sense of hearing that the sense of hearing is reflected by the sense of sight with more strong ability of evoking attention, the promotion effect between different senses, the synergistic effect between sense and stress, participation in VDT syndrome such as general malaise, relevance to circadian rhythm due to the reflection to the pineal body by the exposure of light and electromagnetic fields, the change of brain waves in the case when we have received sound and light at the same time, chromesthesia, the cooperation effect of music and picture and so on. Since now these modern problems and high technology are relationally double-faced sides [4] of the same coin, we can give many concrete examples.

In fact, owing to the popularization of IT instruments such as cellular phone, cordless phone, personal computer and so on, both in the inside of the room and in the inside of the car, we are surrounded more and more by electronic instruments and live always under the exposure of artificial electromagnetic radiation as if smog. So, the environmental problems (such as VDT syndrome, electromagnetic wave erethism and so on) in which the reflection of compound effect and accumulation effect induced by mixture of sound, light, electromagnetic wave, heat and so on, must be taken into consideration are arising even if we choose the problems in the only limited field of the wavy physical science as an example [5–12]. However, as the present situation in every branch of knowledge, it seems that each problem is decomposed owing to our human professional interest first to some parts in fragments belonging to different fields and in the present condition that each part is separately studied. Furthermore, not only in the acoustic environment but also in the electromagnetic environment, it can be said that almost all are mainly the studies in the frequency domain and few are studies in the time domain. Even in basic studies to solve the problems, it seems that any of quantitative studies related to compound effect and accumulation effect between different environmental factors such as sound, electromagnetic wave and so on in electrified indoor environment cannot be almost found even as a motive and a trial. As stated in the above introduction, if we remember in principle the genesis of our existence, it can be said that there are in principle no any phenomena not related to other different environmental factors including the one in the humanities.

As stated in Appendix II, since originally we cannot live without the environment, in principle there is no spirit under no support of any material and there is no quality under no support of any quantity, our mind are naturally unified with our body. It can be said that

"Live" doesn't exist without first recognizing the total balance and manifold mutual intermediations of all systems in inside and outside of ourselves which are the real fresh-and-blood creatures. That is, it seems indispensable that not only extending the separately fragmentary abilities acquired in the infancy and afterward filling up gaps between them but also training and educating that the total balance is the most important (not only for each person but also for the organization). Increasing in one-sided way the amount of the production of the high technology hardware and software such as the personal computer, the cellular phone, the game software and so on brings the change of the economic structure in the society by being drilled through the anti-natural properties such as abnormal accuracy and speed which the advance of artificial machines essentially posses. As a result, it brings necessarily the qualitative change of the social organization by being freed from the common ideas such as the politics, the ethics, the religion and so on. We cannot help but fear that, in another side, it makes the natural environment and the social environment rapidly change to the inhuman and immoral modes, and fall the (essential) human nature such as goodness, truth, beauty and philanthropy to the low level step by step together with the advancement and the speedup of the high-technology (which we cannot protect from the hacker). We think that this is the reason that the mutual intermediation between the natural science and the humanities which cannot be originally divided should be considered as a central theme to people of today who live at this time and in this ring.

Under a firm basis of the above-mentioned ideas, let us establish on trial concretely the corresponding methodology of our present study. That is, first, we have to try to extract all sort of mutual correlation information both in time and space regions among every kind of environmental factors from the viewpoint of "Relationism-First". If possible, it seems better for us to first extract them especially in the hierarchical form of linear and non-linear correlations of higher order with the 1-st, 2-nd, 3-rd, … orders. More explicitly, at the next stage of methodological concrete measure, in this paper, our study from two standpoints-time region and space regions has been given in principle in a marked contrast style.

REFERENCES

1. D. Middleton. Statistical-physical models of electromagnetic interference. IEEE Trans. Electromagnetic Compatibility, vol. EMC-19, 106–127, 1977.
2. D. Middleton. Canonical non-Gaussian noise models: Their applications for measurement and for prediction of receiver performance. IEEE Trans. Electromagnetic Compatibility, vol. EMC-21, 209–220, 1979.
3. Henri Pieron. LA SENSATION. Original Copyright by Presses Universitaires de France (Japanese translation), Hakusisha, Tokyo, 1987.
4. M. Ohta, E. Uchino. The Course of Science and Technology, and Acoustics: Past, Present and Future-Turning to Information Acoustics. Chinese journal of acoustics, vol. 11, N°3, 213–223, 1992.
5. Y. Fujita, M. Ohta, H. Ogawa. A methodological quantitative trial based on hierarchical mutual intermediation between different fields – A trial to some synthetic evaluation for high-technology pollution (II). Technical Report of IEICE, vol. 104, N°223, 33–38.
6. H. Ogawa, M. Ohta. Inter-subjective relationship among different factors in indoor electromagnetic environment – a methodological trial for evaluation of compound and/or cumulative effects. Technical report of IEICE, vol.104, N°455, 7–12, 2004.
7. M. Ohta, H. Ogawa. A methodological trial of regression analysis with higher order correlation between electromagnetic and sound waves leaked by a VDT in an actual working environment. Journal of Electromagnetic Waves and Application, vol. 12, N°10, 1357–1367, 1998.

8. M. Ohta, A. Ikuta, H. Ogawa. A stochastic evaluation theory in multi-dimensional signal space for EM interference noise and its experimental relationship to acoustic environment. Trans. IEE of Japan (C), vol. 118, N°4, 465–475, 1998.
9. M. Ohta, Y. Mitani, N. Nakasako. A fundamental study on the statistical evaluation of receiver response for an electromagnetic wave environment in multi-dimensional signal space – theory and basic experiment. Journal of Electromagnetic Waves and Applications, vol.12, N°5, 677–699, 1998.
10. M. Ohta, Y. Mitani, H. Ogawa. Multi-dimensional generalization in space and time domain for Middleton's study in stochastic evaluation of correlative many EM noise processes. Electromagnetic Waves PIERS 24, ed. J. A. Kong, Chap. 5, 97–118, EMW Publishing, Cambridge, 1999.
11. M. Ohta, H. Ogawa. A trial on hierarchical extraction of higher order correlation between electromagnetic and sound waves around a VDT environment – Practical use of background noise and probability prediction. Electromagnetic Waves PIER 34, ed. J. A. Kong, Chap. 12, 285–298, EMW Publishing, Cambridge, 2001.
12. H. Ogawa, M. Ohta, A. Ikuta. A trial on stochastic evaluation of near-by electromagnetic fields leaked from ITE group under parallel operating situation. Journal of Electromagnetic Waves and Applications, vol. 18, N°12, 1621–1635, 2004.