



HUMILITY AS A SCIENTIFIC PRINCIPLE

by

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Humility is a notion which seems to have little, if any connection to the paradigm of modern science. It could be essential to understand the personality of some scientists, particularly in their motivation in doing research. Balance of religious feeling, and of secular ethics would be here a relevant topic for discussion. However it would not change general outline of the situation. "My religion consists of a *humble* admiration of the illimitable superior spirit who reveals himself in the slight details we are able to perceive with our frail and feeble minds",- A.Einstein remarked (cited from Lemkow 1990, p.202).The word italicized by us expresses the situation in a relevant way.

The situation could be however quite different in some realms of pre-scientific spirituality, as well as postmodern science. Demonstrating this possibility, and discussing its essence is the objective of the present report.

Mendeleyev

Religious and ethical aspects of humility form an essential background of the work of a scientist. However their influence upon the scientific research is mostly external, defining its limitations, and - to a definite extent - most general guidelines. As to internal aspects, they tend to be labeled by different terms, belonging in general to the same psychological orientation. A place of honor should be given in this respect to *economy of means*, which has played an important role for shaping of scientific style of quite a few leading minds of classical and modern science.

The notion is quite well known to modern philosophy of science. Einstein regarded it as one of the two major criteria in evaluation of a scientific theory. Its essence is drawing the maximum of conclusions from the minimal set of assumptions. To consider specific traits of this criterion, we would recur to two examples, taking one from the realm of natural sciences, another one - from life sciences.

The first example is the main contribution of D.Mendeleyev, being *the periodical law of chemical elements*. In order to form it, the chemist needed to introduce an "alphabet" - that is, atomic weights of chemical elements, and a "grammar", - a table where the weights were to be inserted. This description procedure was remarkably economical.

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However in order to introduce it Mendeleev had to adjust - *a priori*, just for the sake of harmony - atomic weights of 28 elements (out of 64 known by that time). In doing this almost scandalous step, Mendeleev sacrificed precision of measurement available at his times (as well as his academic reputation) in favor of the economy of means. This step was taken, producing an impressive result.

By the way, the discovery was done in one day (not to mention all the preceding life of the scientist). The full set of preparatory sketches was preserved, and is available for study. In his voluminous book, B.Kedrov (1958) presented an interesting set of additional materials concerning the process of how Mendeleev designed his table. The set appears quite constructive even for the contemporary philosophy of science. One could mention in this respect the method of "*patience play*" used by Mendeleev; association with the well-known ideas by Levy-Strauss would be justified. Another example is sort of "lucid dream" of a Table, recorded by the scientist, as well as some other psychotechnical details.

Pavlov

The main achievement of I.Pavlov was *the theory of conditioned reflexes* (he received the 1904 Nobel Prize, but for a different work, dedicated to physiology of digestion). The main part of Pavlov's work was done by means of observation of animals in laboratory conditions, based on the scheme "*stimulus - reaction*". The latter consisted in states of the system of salivation; the former - in different types of signals, replacing initially the food, and then one another, by the law of association.

In this way Pavlov demonstrated how one, proceeding from unconditioned reflexes, could introduce more and more sophisticated sign systems producing the same physiological effect. Consequently basic unity of physiology and semiotics,- or, in more general terms, mind and body,- was demonstrated (Asratian 1981, p.160 - 169).

To achieve this fundamental result, Pavlov reduced his research apparatus to the limits, repudiating the sophisticated analytical method which prevailed in his times, and partly its results. In comparison to this method, Pavlov's own methodologies looked quite primitive. However it was this reduction that led him to his impressive discovery.

Pavlov's work was often regarded in the framework of primitive materialism. However economy of means does not necessarily mean oversimplification. Structurally similar guideline has recently been assumed by such a spiritually mature discipline as somatics.

"Somatics is legitimately characterized as a field because its many methods share a common focus on the relationships between the body and cognition, emotion, volition, and other dimensions of the self",- wrote one of its leaders, D.Johnson (cited from Murphy 1992, p.386; a highly personal introduction into the field has recently been published by Johnson, 1994).

One has to remark that Pavlov's view of the essence of his results was far from being reductionist. One might recur in this respect to some of his later works, as well as to oral tradition of his pupils and colleagues. However this topic belongs to a separate work (for recently published non-traditional approach to Pavlov's results, in connection with some major ideas of W.James and S.Freud cf. Zhuravsky 1991).

Striving towards the economy of means has left its imprint upon both the scientific style, and to a considerable extent upon the way of life of the two great scientists that we have just spoken of, as well as a number of their colleagues. The corresponding motivation seems to be rooted in the intuitive feeling of how the world is structured, and very often has religious connotations. We have already mentioned in this respect Einstein's concept of the criteria of a scientific theory (presented very clearly in such texts as his 1943 Autobiography; economy of means is often labeled here as "*inner perfection*"). As it was emphasized by a commentator of this program, "according to Einstein, mathematical perfection takes on gnoseological value; perfection of a theory reflects its similarity to the objective world". As to the latter, we are reminded of such statements of Einstein as "the religious feeling of a scientist consists in exalted worship of the harmony of the laws of nature" (Kuznetsov 1972, pp.78 and 410).

Similar strings bringing together scientific and spiritual aspects of the economy of means (or "*consilience of inductions*", to use a term of W.Whewell, cf.Ruse 1994) in designing a theory may be reconstructed in the outlook of many other serious scientists, both in Russia and in the West, professing adherence to the great scientific tradition introduced by "*Newtonian mechanics, Darwinian biology, and mass democracy*", to cite an expression coined by R.Rorty (1994, p.33)

in his report to the recent 19th International Philosophical Congress. Structurally this notion presents a most plausible "internal" scientific analog to the "external" religious and ethical aspects of humility, and should be regarded as *definitely epistemological* (and devoid of any dogmatism whatsoever).

To make a concluding remark, the intuition of some kind of isomorphism between a theory and the world should not be regarded as universal. As it was formulated by Th.Kuhn, the author of the influential *Structure of the Scientific Revolutions*, "the notion of a match between the ontology of a theory and its "real" counterpart in nature now seems to me illusive in principle" (cited from Griffin 1988, p.35). Along this line, humility should rather be understood as kind of deconstruction, that would as well attain epistemological value to it.

Hesychasm

Possibilities of rapprochement between modern science and traditional spirituality seem to be exhausted at this point, at least in the realm of humility. However a careful analysis allows to widen their scope. To do this, we would recur to the traditional Christian doctrine, serving historically as thesis, with respect to the antithesis promoted by the classical science. In doing this, we would first concentrate upon Oriental Christian tradition, passing next to its Western counterpart. The reason is that the traits sought by us have been historically revealed in a more distinctive (but not necessarily constructive) manner in the East.

Tradition we would begin with is known as Hesychasm. The term means "*quietism*" in Greek; the tradition has been the official doctrine of the Orthodox church since the 14th century (and still quite active in Russia in times of Pavlov and Mendeleyev). Psychotechnique has constituted the most well-known part of the Hesychast legacy; it was traced back to the monastic practices of the 4-7th centuries (and via it farther into ascetic subcultures of ancient Egypt, Palestine, and Asia Minor).

Hesychast psychotechnique includes such well-elaborated notions as *navel contemplation*, *measured breathwork*, *direction of breath into conventional points in the body*, *specific phonation*, and so on. It was already in the 1950s that culturologists supposed their affinity with

such notions, as *asanas*, *anapana*, *chakras*, *japa*; and of the whole set - with the Indian yoga (von Ivánka 1952; a similar approach had been proposed in theosophical literature much earlier, cf. Lodyzhensky 1912, p.318-325). Special research has proved this approach to be nearer to a metaphor, than to strict similarity (Matus 1984). However one should not underestimate the presence of such a sophisticated doctrine of alteration of consciousness in the framework of medieval (and to some extent contemporary) Christian world (the major source book remaining the illustrious fifth volume of the *Philokalia*, 1889).

It is much less known that Hesychasm should be in fact regarded as contrary to such key phenomenon of the Western culture as *Renaissance*. To formulate more accurately, both should be regarded as different answers to the same metaphysical question. Historically it looked like the Byzantine Humanists, having lost in a series of disputes, fled to the West, giving impetus to the Renaissance. As to Byzantine Hesychasts, they gained victory, eradicated seeds of Renaissance, and later disseminated their teachings in Russia (Meiendorf 1985, p.333-346). "The iron curtain", as well as other modern phenomena belonging to the split between East and West, may be *mutatis mutandis* traced back to this division (which in itself prolonged the line initiated by the division of the Roman empire into two parts in the 3rd century AD).

A major problem of a religion is the existence of God, with a set of ensuing questions concerning its demonstration, attributes, etc. Position of Hesychasm in this respect was formulated in a peculiar way. It refused to accept such demonstrations as *gnoseological* ("I can directly cognize God"), *symbolic* ("I can cognize God indirectly, via his creation"), *strictly-psycho-technical* ("I can cognize God by means of right practice"), *magical* ("I can compel God to do what I need, independent of whether he is cognizable"). These and a set of other alternatives elaborated by that time were sacrificed to the paradigm labeled by Berdyayev as "*ontological realism*": "I can neither cognize God, nor reach Him in any way, but I can merge with Him".

"I am a man, having a mission to become god", - wrote a major precursor of Hesychasm, St. Basil the Great (cited from Kontsevich 1990,p.48). Hesychasts of the 14th century continued this thesis, speaking of mortals "becoming gods by grace" (cited from Prokhorov 1986, p.92).

Distinction between theology and mysticism, essential for the European tradition in general, was thus removed. However basic philosophical problems remained intact, and Hesychasts had to introduce a new conceptual framework, based heavily upon ontologism. It is at this stage that humility appeared: the basic texts of Hesychasm invariably attach to it a place of honor, and a practically decisive role.

Humility in Hesychasm

One of the renowned Hesychast authors, avva Dorotheus, symbolized establishment of a theory by erection of a spiritual building (to speak precisely, he spoke not of theory, but of its Hesychast analog - "*theoria*"; this distinction might be essential to retain by means of a special term; cf. Minin 1915, p.40-61). Enumerating building materials, the avva emphasized: "It is humility which is the cement solidifying everything into the whole; without it, no good thing is virtue; without it, one cannot save oneself" (cited from Kontsevich 1990, p.15). There is a wealth of similar citations corroborating this statement. Humility is introduced in Hesychasm against the background of a set of antinomies. We would tentatively summarize three of them:

-the ontological border between God and man is impassable; still, it is passable for divine energies (this line was further elaborated into the "*doctrine of energies*");

-divine energies descend, in order to merge with human energies; thus a bridge is formed which is to bring a Hesychast to his objective. The energetic bridge is solid and reliable, but at the same time fragile and not durable, even for the greatest adepts (this concept was further developed into the "*doctrine of synergy*"). According to modern Western theologians, division in this respect was crucial for the split between Oriental Christian tradition and Western theology: in the latter, similar paradigmatic shift was undertaken as late as in the work of Alfred North Whitehead (Griffin 1989, p.121);

-a Hesychast is to rigorously align his energies along traditional patterns. Nevertheless, every result of his labour is automatically destroyed by apprehension or judgement. "Mistrust in one's own "good" thoughts and feelings", - wrote in line with the Hesychast tradition an American Orthodox theologian, - "is the most essential Christian virtue" (Rose 1991, p.32). In practicing this mistrust, Hesychasts were prepared to go very far; an example was provided by the famous story

of St. Pachomius the Great. The story said that in the end of his spiritual ascension the great adept had a vision of Christ standing in front of him. Clinging fast to his tradition, the adept spat in the face of Jesus; the vision dissolved, and the demon who had created it, withdrew rapidly and not without wrath (Brianchaninov 1905, p.49; this line was further elaborated into the "*doctrine of metanoia*", cf. Khoruzhy 1994, p.440).

In order to resume his ascension, a Hesychast had to practice the art of simultaneously applying accelerator, brake, and clutch (the author allows himself to repeat here a fairly disrespectful, but in fact quite apt metaphor used by one of his students). It was this art which bore the name of humility. In practicing it, an adept released and tried to operate such powerful energies, that his meditation was traditionally compared to *riding a typhoon* (Kontsevich 1990, p.15). Hesychasts use to grow very serious when mentioning such trips.

Humility in Hesychasm, as a result of the peculiar structure of its "ontological realism", bears *a distinctly ontological character*, taken in its dynamic aspect. This seems to be particularly constructive for our topic, because contemporary science is engaged on its deepest levels in resolving ontological problems. This does not mean that Hesychasm was a science, or would be able to become it some time. It only implies that science and Hesychasm come to a common ground in such a notion as humility, where exchange of insights between them would be proper and relevant.

Catholicism and Protestantism

Having had a place of honor in Oriental Christian mysticism, humility should definitely not be regarded as a product of the "Eastern mind". To get a deeper insight into the problem, we would briefly regard situation in Western Europe prior to upsurge of classical science, concentrating upon a peculiar discussion on how to interpret a well-known verse from the First Epistle to the Corinthians (7:21).

St. Paul discussed here relation between the active and the contemplative life. "Let every man abide in the same calling wherein he was called",- said the apostle in verse 20, and continued: "Art thou called *being* a servant? care not for it: but if thou mayest be made free, use it rather". The words underlined by us render wording of the Greek original quite accurately,

together with its inherent ambiguity ("all'ei kai dynasai eleytheros genesthai, mallon chresai").

Should a man *humbly* remain servant of another man (and become a servant of God in addition), or should he use opportunity and become free? Luther inclined to the latter in his translation; this line was pregnant with "*Protestant ethics*", with the decisive contribution it made in due course to the emergence of classical science.

Catholic culture was more inclined to the former. "Servir le Seigneur est plus urgent que changer de condition (7:17-24): c'est l'appel et non la condition humaine qui est décisif",- a prominent modern Catholic commentator summarized (Carrez 1977, p.65). One feels here primacy of the *vita contemplativa*, along with ensuing sociocultural implications.

Variants of translation are not limited by the two presented ones. Interpretation becomes even more questionable if one takes into account obligatory parallels from other parts of the canon,- primarily, Matthew (11:29): "Take my yoke upon you, and learn of me; for I am meek and lowly in heart..." - the Greek original speaks of humility: "hoti praos eimi kai tapeinos te kardia" (underlined by us).

To make the picture complete, one could mention here that the position of Russian Orthodox theologians in interpreting the Epistle was ultra-contemplative. In order to emphasize it, the Church Slavonic translators have even inserted addition into the original text: "but if thou mayest be free, enslave yourself even more",- cf. Kurayev 1994, p.102.

Typological affinity to the Catholic position is possible here. In fact, there were influential schools in Catholic history, revealing affinity to "ontological realism", and even to its psychotechniques; this was the case of the Victorine subculture at the times of its acme in the 12th century (Baron 1957, p.170-185, 209, cf. Spivak 1992; for basic texts see Richard de Saint Victor 1955). Thus difference in *approaches to humility* was shaped not by the deceptive and shallow cleft between East and West, but by much subtler processes, essential for the development of Western civilization in general.

Postmodern science

Humility may be regarded as related to a cluster of concepts implementing alternative orientation in contemporary science, primarily in postmodern ecological and social criticism. An

obvious example is scientific production of E.F.Schumacher, mainly ideas expressed in his famous book, *Small Is Beautiful*.

Schumacher advocated removal from the top of the list of priorities such notions as gross national product, introducing in their stead *alternative labour and production ethics* (Lemkow 1990, p.230-233). It was to be based upon universal values, even in spite of personal interests, and *inevitable self-limitation*, necessary to pursue this strategy.

A neighboring concept of *Stasis* was proposed by I.Illich; its purport was defined as "sustainability without development", as the principal way of preventing ecological catastrophe. The role attached to *self-limitation* in pursuing this strategy was so decisive that it tends to be regarded as sort of social asceticism (Toffler 1991, p.379). Another influential sociologist turned for innovative notions to the Far East, importing the "*technology of self-limitation*": "In Japanese *Kaizen*, every single step is a small one - a minor change here, a minor improvement there. But the aim is to produce by means of step-by-step improvements a radically different product, process, or service a few years later" (Drucker 1994, p.191).

What one sees here is in fact fragments of a potential philosophy of sacrificing extensive societal - and personal - progress imminent for mass consumption society, in favor of intensive and slow evolution, under the auspices of self-discipline. Humility definitely belongs here; it should be regarded as rooted in self-limitation, and *revealing a distinctly pragmatic character* (as forming a premise for any further innovations).

The concept of holomovement was initiated by D.Bohm basing on problems of physics, and was extended further to fundamental problems of life and matter. In doing this, Bohm tended to regard both the observer and a process as belonging to *the same ontological plane*. The novelty was intentional: "One source of fragmentation - perhaps the *major* one - is the belief that our thinking process and what we are thinking about are fundamentally distinct" (Bohm 1988, p.67). The ensuing type of subject-object relation seems to presuppose a category similar to what was labeled by us above as *the ontological type of humility*. A similar trend is proper for alternative axiomatics in biology, introduced in the framework of the Santiago school (cf. Lemkow 1990, p.139-140). Insights from the traditional "ontological realism" ought to be quite

useful here.

To sum up, one is unlikely to find either humility or some similar concept, looking through indices of textbooks on philosophy of science, or of different branches of the latter. In spite of this fact, we have been able to trace back connection of humility to *fundamental problems of science*, particularly in its relation to the spiritual and universal values; this connection seems to be essential for the future development of science.

Bibliography (*books in Russian marked by asterisk (*)*)

Asratian E.A. Ivan Petrovich Pavlov: Life, Creative Production, Contemporary State of the Doctrine. Moscow, Nauka, 1981 (*)

Baron R. Science et Sagesse chez Hugues de Saint-Victor. Paris, Lethielleux, 1957.

Bohm D. Postmodern Science and a Postmodern World.- The Reenchantment of Science: Postmodern Proposals/ Ed.D.R.Griffin. Albany, State University of NY Press, 1988, p.57 - 68.

Brianchaninov I. Ascetic Essays.V.3. St.Petersburg, Tuzov, 1905 (*)

Carrez M. Paul et l'Eglise de Corinthe.- Introduction à la Bible. T.3, v.3. Paris, Dasclée, 1977, p.51-94.

Drucker P.F. Post-capitalist Society. NY, Harper Business, 1994.

Griffin D.R. Introduction: the Reenchantment of Science.- The Reenchantment of Science: Postmodern Proposals/ Ed.D.R.Griffin. NY, State University of NY Press, 1988, p.1-46.

Johnson D.H. Body, Spirit and Democracy. Berkeley, CA; North Atlantic Books/ Somatic Resources, 1994.

Kedrov B.M. The Day of a Great Discovery. Moscow, Izdatelstvo sotsialno- ekonomicheskoi literatury, 1958 (*)

Khoruzhy S.S. After the Interval: Ways of the Russian Philosophy. St.Petersburg, Aletheia, 1994 (*)

Kontsevich I.M. Gaining the Holy Spirit in Old Russia. Kiev, Edition of the Exarch of Ukraine, 1990 (*)

Kurayev A. Is it the Same, How to Trust? Collection of Essays in Comparative Theology. Klin,

Edition of St.Tykhon Fraternity, 1994 (*)

Kuznetsov B.G. Einstein: Life, Death, Immortality. Moscow, Nauka, 1972 (*)

Lemkow A.F. The Wholeness Principle: Dynamics of Unity within Science, Religion and Society. Wheaton-Madras-L., Quest Books, 1990.

Lodyzhensky M.V. Superconsciousness and Ways to Attain it: Indian Raja-Yoga and Christian Asceticism: an Essay of Inquiry. St.Petersburg, s.l., 1912 (*)

Matus Th. Yoga and Jesus Prayer Tradition: an Experiment in Faith. Ramsey, NJ; Paulist Press, 1984.

Meiendorf I.F. Introduction into Patristic Theology: a Summary of Lectures. NY, RBR, 1985 (*)

Minin P. Main Directions of Old Church Mysticism. Sergiev Posad, Edition of Trinity St.Serge Monastery, 1915 (*)

Murphy M. The Future of the Body: Explorations into the Further Evolution of Human Nature. LA, J.P.Tarcher, 1992.

Ouspensky P. Christian Orient: Athos. V.3, p.1. Kiev, V.Frontskevich, 1877 (*)

Philokalia. V.3/ Ed.Bishop Feofan. Moscow, Edition of the Russian St.Panteleimon Monastery on Mt.Athos, 1889 (*)

Prokhorov G.M. Hesychasm and Social Thought in Eastern Europe in the 14th Century.- Works of the Department of Old Russian Literature, 1968, V.23, p.86-108 (*)

Richard de Saint Victor. Les quatre degrés de la violente charité.- Ives. Epitre à Séverin sur la charité; Richard de Saint-Victor. Op.cit./ Ed.G.Dumeige. Paris, Librairie philosophique J.Vrin, 1955.

Rorty R. Philosophy and Future.- Voprosy Philosophii, 1994, No 6, p.29-34 (*)

Rose S. Soul after Death.- Nauka i Religia, 1991, No 5,p.28-35 (*)

Ruse M. Struggle for the soul of science.- The Sciences, 1994, No 6, p.39-44.

Spivak D. Linguistics of altered states of consciousness. Bochum, Brockmeyer, 1992.

Toffler A. Powershift: Knowledge, Wealth, and Violence at the Edge of the 21st Century. L., Bantam Books, 1991.

Von Ivánka E. Byzantinische Yogis?- Zeitschrift der Deutschen Morgenländischen Gesellschaft,

1952, No 2, S.234-239.

Zhuravsky D. Unrealizable Project of Ivan Pavlov. - *Voprosy Filosofii*, 1991, No 9, p.14-31

(*)