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# "Between unmanned and manned space research"

## *Dr. Siegfried J. Bauer for his 80th birthday*

**Eulogy by Gerd K. Hartmann, March 2011**

Dr. Siegfried J. Bauer, professor emeritus at Karl-Franzens University at Graz, Austria, celebrated his 80th birthday in 2010.

He was born on 13 September 1930 in Klagenfurt (Carinthia), Austria. He grew up in Griffen (Austria). In 1948 he has passed with honors at the (monastery) high school St. Paul in Lavanttal (Austria) the general qualification for university. Then he studied at the university of Graz (Austria) physics, geophysics and meteorology and completed his Ph.D. in 1953. Immediately thereafter, under the project "Paper Clip" of the US Military, he carried out research work in the US with a lunar radar to study the ionosphere of the Earth. From 1961 to 1981 he worked as a scientist at NASA Goddard Space Flight Center in Greenbelt, Maryland, USA. From 1975 he was there the "Associate Director of Science" – directing over 400 employees. 1981 he was appointed professor of Meteorology and Geophysics by the Karl-Franzens University at Graz. In 1998 he became emeritus professor of that university. His research focus was and still is planetary atmospheres and global environmental problems (Bauer and Lammer, 2004). He is married since 1955 to Inge, born Heiditsch. In 1964, the daughter Sonya was born. She has four children and lives like her parents in Graz.

Dr. Bauer wrote a self-biography in English (2003) and one in German (2005). He has introduced the German version with a saying of the German poet Johann Wolfgang von Goethe:

*The greatest happiness for the thinking man is to have explored the explorable and to admire the inexplorable.*

This clearly shows – his partly inherited – specific European understanding of the complementarity principle (Bohr, 1961) – see also the Appendix – which strongly influenced his scientific thinking and inspired relevant decision making processes, much earlier than without this understanding. Thus one might see it as an important early warning system.

Three phases of the honored can be distinguished: Phase (1) before reaching the age of 30 can be described by self-adaptation to the "reality", mainly in Europe but also the USA. This was very difficult because of the war and post-war consequences, Phase (2) prior to the age of 50 can be described by ascertaining and decision making, mainly at NASA while experiencing the increasing tension between unmanned and manned Space Research.

The unmanned Space Research provides the chance of "*feeling more secureness*" in and for the human community, specifically by the search for other life in our universe. In a publication Dr. Bauer stated that very likely the discovery of other life is foreseeable in the future, but that the discovery of intelligent life is much less likely. The unmanned Space Research can thus serve the so-called human "swarm behavior", in other words the "*we feeling*", which Siegfried Bauer experienced intensively already in his high school years.

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The manned Space Research represents the individual risk of more "lostness" in zero gravity and the "empty" in the vastness of the universe. It is complementary to the unmanned Space Research and serves the *individual* human behavior, the "*I feeling*". For example it can be viewed as a search for "more (extreme) individual ('inner') adventures". The unpredictable, unwanted, anxiety-creating and partly uncontrollable consciousness change or consciousness extensions can happen as observed e.g. in the fate of some Apollo astronauts.

In summary Dr. Bauer left NASA when the earlier fruitful balanced symbiosis and competition between unmanned and manned Space Research – of "*we and I*" – became too imbalanced as he stated. This mainly happened due to the paradigm change after the termination of the very successful APOLLO Program in 1972. This change might be expressed in the following way: "The ***means*** for promoting Space Research as a whole, namely *technology*, now became the ***goal*** *(aim)* for the domain of manned Space Research". This led to very many negative consequences that frustrated not only scientists like Siegfried Bauer but also many other scientists and engineers inside and outside NASA. This contributed significantly to the two fatal Space Shuttle accidents and led to the termination of the Space Shuttle program in 2011. These drastic changes provoked Dr. Bauer to more "questioning thinking" and further strengthened his *complementary* thinking, resulting in even stronger activities for unmanned Space Research and finally led to the decision to leave NASA already in 1981, which was at that time very unexpected for many colleagues and the author who friendly co-operated with Dr. Bauer since the late 1960s.

Phase (3) which began after the completion of his 50th anniversary and after his return as appointed university professor to the university at Graz, might be described the "awakening to the ordinary", i.e. taking intensive care of his socio-economic-ecologic environment in Graz. Simultaneously from there he also strongly inspired and promoted the unmanned Space Research as can be seen from his many important outstanding scientific publications (Bauer, 2003, 2005).

Congratulations and best wishes for the future from
a colleague and friend,

Gerd Hartmann, March 2011

## Appendix A

The understanding of the complementarity[1] principle by Dr. Bauer means, he has left behind the "subjective empiricism" (positivism) of the Vienna Circle of the 20s of last century as well as the "Platonic objectivist" presuppositions, e.g. those of Kurt Gödel.

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[1]The author G. K. Hartmann understands Bohr's use of the term *complementarity* to mean:

1. That being occurs in two different forms, incompatible with each other if we assume two-valued logic.
2. The two forms can be quantitatively not completely separated, they are "indivisible".
3. The more we approach one aspect the more we remove us from the other. (2) and (3) are the result of the uncertainty relations.