Predictability in Science: Accuracy and Limitations of Predictions based on Scientific Knowledge

In its last two business meetings the PAS Council discussed several alternative topics that had been proposed for the next Plenary Session of the Pontifical Academy of Sciences in November 2006. On the basis of these deliberations the Council has chosen the theme of 'Predictability in Science'. This theme is situated at the interphase between fundamental science and its practical applications to the benefit of human beings. We will welcome contributions on scientific predictions of impending dangers, such as earthquakes, on the outlook for climate change, on the analysis of nuclear and other technologies, in the role of prediction in the medical sciences, and on many other scientific predictions and modelling approaches that frequently also have their applications with impact on cultural and socio-political developments.

According to Webster's dictionary the word prediction has two meanings: (1) a predicting or being predicted, and (2) a prophecy. Obviously, only the first meaning applies to our proposed theme. Therefore the word science in the title is important. It is not our role to debate on prophecies. Predictions on a scientific basis can be more or less accurate and have in most cases their intrinsic limitations. We therefore consider expressing this in a subheading. The proposed theme would then read as follows: *Predictability in Science: Accuracy and Limitations of Predictions based on Scientific Knowledge*.

We expect that all scientific disciplines can contribute with selected examples to a wide debate on scientific predictions and their relevance to society. Thereby, the awareness of natural limitations that are inherent to many predictions plays an important role and it can insure the trust in science in interactions between science and the civil society. The distinction between certainties and uncertainties has since long been made by many scientists presenting scientific knowledge,

theories and models on natural developments. A candid discussion on this theme by the Pontifical Academy of Sciences can represent a clarifying view for both the scientific community and the general public.

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