

的程度就跟他相同（根據他自己的陳述），我想他說明之清晰，必為一主因。

他的課程，總是站在最前端，一九〇八～一九一〇年間，他講 *Special theory of relativity*（尤其強調 *Minkowski Space*）一九二六年講 *Wave Mechanics*，當時 *Linus Pauling* 是他最得意的門徒。以後，他研究電子在金屬內的運動情形，*C. Eckart*, *W. V. Houston*，*Condon* 等跟他工作，*Lande* 在他的指引下，發表了有名的 *g-formulas* 一九二〇～一九二二年間，是個最偉大的時代。在 *Munich Institute of Technology*，來了兩位新生，一個是維也納來的 *Pauli*，一個是 *Munich* 的 *Heisenberg*。*Pauli* 的父親是個有名的藥學家，他剛把 *Einstein* 的 *relativity theory* 讀過，自感甚有心得，自求受業門下。而 *Heisenberg* 的父親是個語文學家，認為他很有數學，物理的天才，便介紹給 *Sommerfeld*。*Heisenberg* 在聽了一學期的 *Mechanics* 後，第二學期，當講到 *hydrodynamics* 時，他便要求發表一篇有關“渦流”的論文。這兩位後來的成就，自不在話下。

Sommerfeld 的講演，甚具吸引力。*Born* 本是一個動物系的畢業生，在聆聽過他的一次演講後，矢志轉攻物理。當他在一九四八年得到 *American Association of Physics Teachers* 所授與的 *Oersted Medal* 時，他的學生群起發表感激之言*，*Debye* 說：他小心估計着學生們的需要，摒棄個人的好惡，他給學生的印象，不是一個道貌岸然的嚴師，而是一個可親近的益友，跟大家研究着有趣的問題。

Sommerfeld 於一八九七年結婚，育有三子一女，晚年從事著書工作，精力仍旺。不幸，在一次車禍中受了重傷，經一段時期的痛苦後，終在一九五一年四月廿一日長眠地下，留着舉世的痛哭與哀悼。

*：見 *American Journal of Physics*. 17. 1949.

Reference: *American Journal of Physics*. Jan. 1968.
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訪問 Dr. Markus

We asked Dr. Markus, visiting professor to the Taiwan and Tsing Hua Universities since October 1967, from the Nuclear Research Center in Germany, about his impressions regarding the study of nuclear physics in Taiwan.

Professor Markus approves the interest and diligence of students and a high standard of theoretical knowledge especially at our university. He feels, however, that there is an overestimation of pure formalism without sufficient critical regard to the underlying physical facts. An understanding of natural phenomena can hardly be obtained by book-learning only. Science is distinguished from traditional scholarly learning by its essentially experimental, non-authoritative method, Professor Markus pointed out.

Asked how he thinks about the difficulties in the development of experimental nuclear research in Taiwan, Professor Markus said that to his opinion the age-honored traditions of Chinese education and in particular the examination system, efficient as they may be in other fields and in many respects, are unfavorable for science to a higher extent than just the limited material conditions for experimental research work in Taiwan. He believes that this situation is also the major reason, before any financial aspects, especially for the best Chinese students of physics to go abroad, where these students are most welcome because of their good capabilities.

Professor Markus is reluctant to answer our question about his estimate for the general development of nuclear physics in the future, interjecting that this might come close to prophecy which indeed is not the business of a physicist. The ultimate goal of nuclear physics being a complete and exact description of the typical nuclear forces which consequently would allow the prediction of all nuclear phenomena, a corresponding theory seems still far from being perfected. The abundance of specific properties of the forces in question, which we know from systematic experimental observation, clearly indicates that we deal with an extremely complex system. A future solution of the nuclear problem might be expected from several approaches; in particular, from nuclear models with always more improved Hamiltonians, oriented closely to experiment. This approach is characterized by the promising development of many-particle theories in recent years. The most fundamental approach may come from the study of elementary particles. However the development in this direction seems not yet very far from its beginning.

Professor Markus is returning to Germany in July, we thank him for this interview. (林啓東記)