

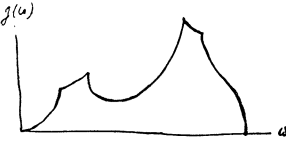
$$\lim_{\epsilon \rightarrow 0} \frac{1}{\epsilon} \int_{-\epsilon}^{\epsilon} \delta(E_1 - E_2) | \langle \psi | \psi \rangle |^2 dE_1 dE_2$$

$$\lim_{\epsilon \rightarrow 0} \int_{-\epsilon}^{\epsilon} \delta(E_1 - E_2) | \langle \psi | \psi \rangle |^2 dE_1 dE_2 = 0 \quad \text{if } \epsilon \neq 0$$

$$\lim_{\epsilon \rightarrow 0} \int_{-\epsilon}^{\epsilon} \delta(E_1 - E_2) | \langle \psi | \psi \rangle |^2 dE_1 dE_2 = 1 \quad \text{if } \epsilon = 0$$

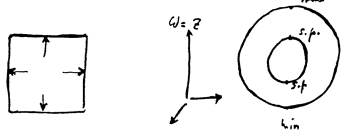
In determining the law of evolution of the structural properties of a macroscopic phenomenon

4th problem Harmonic crystal
 Elastic frequency distribution



frequency as function of wave vector $\omega = \omega(\vec{k})$
 periodic $\omega(\vec{k} + n_1 \vec{e}_1 + n_2 \vec{e}_2 + n_3 \vec{e}_3) = \omega(\vec{k})$
 A periodic function of 3 variables has at least
 a minimum ($\frac{\partial \omega}{\partial \vec{k}} = 0$)
 a maximum
 6 saddle points (Theorem of Morse!)

(In 2 variables: 1 min, 1 max, 3 saddle points)



Conclusion Power of mathematics to show ~~some~~ light on natural phenomena
 has made a decision in favour of elementary particle physics
 Still mathematics will have beauty on other questions
 This has been kind to illustrate in our lecture
 (The beautiful and mysterious power
 common to quantum case not carried over yet.)

E. P. Wigner
 "The unreasonable
 effectiveness of mathematics
 in the Natural Sciences"
 Rev. General Relativity 9:194
 Comm. Pure and Applied Math
 XIII (1960)

was not restricted to teaching young students. There are many physicists in Holland and elsewhere who learned essential parts of their speciality in either Statistical Mechanics or Particle Physics from the advanced courses Léon presented all over the world. For many years after he had left Utrecht he returned regularly, first to Utrecht, and later to Nijmegen to give courses on advanced subjects. In the spring of 1982 he was Lorentz-Professor in Leiden. These were occasions where all Dutch physicists would meet to enjoy his lectures and learn about the latest developments in particle physics. The topics he chose for these lectures were not his personal hobbies but they were what he considered to be the most significant developments in the field. He presented these subjects clearly, elegantly and with no more mathematics than strictly necessary. One always came home after such lectures wishing to learn more. It is no wonder that he was always a welcome speaker in Les Houches and other summer schools.

However there was another, even more important, aspect to his teaching. I profited most from my personal interaction with Léon. He taught me how to do research. I remember the period I worked for my PhD in Utrecht under his guidance as most stimulating due to our daily discussions. He helped, made suggestions, criticized and all that in such a way that a lasting friendship developed. I know that many others had such experiences during one phase or another in their scientific career. They have fond memories of the many discussions they had with Léon, mostly but certainly not always about physics, and always leading to better understanding.

of scientific progress.' Also at CERN, Léon Van Hove was an experienced teacher who could clarify complex issues in simple terms and who took pleasure in doing so. The European physics and astronomy communities have lost one of their most distinguished members.

A gifted teacher

by N.M. Hugenholtz

Notwithstanding his many and important papers on basic problems in physics, it may well be that Léon Van Hove's influence on the physics community is in a large part due to the fact that he was a gifted and devoted teacher. It is perhaps unfortunate that the period of his life during which he was a university professor and gave basic train-

ing to young students in theoretical physics was rather short. Nevertheless those six years at the University of Utrecht from 1954 to 1960 left a lasting impression on physics in the Netherlands. Many Dutch physicists still remember his classes on Statistical Mechanics, Quantum Mechanics and Field Theory. He as no other mastered the art of organizing a subject and then presenting it with extreme clarity, without hiding the difficulties. No wonder that his lecture notes on these subjects were much in demand. When in 1960 Léon decided to accept a position at CERN, the University of Utrecht hastened to offer him an extraordinary chair so that the physics community in the Netherlands could continue to profit from his talents.

Of course his role as a teacher

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