

The genesis of the Karlsruhe Physics Course

1975: The development of the KPK begins (The Nuffield and the PSSC exist already.) Before developing a school version there was always the work on a version for the University. In this way it was assured, that the course could serve as a solid basis for any follow-up course.

1988-1992

Test of the KPK at 20 selected schools in the Federal State of Baden-Württemberg, under the supervision of the Ministry for Culture and Sport.

1994

Thanks to a special clause in the official curriculum the KPK can be used at all High Schools in Baden-Württemberg. The course is marketed by the *Landesinstitut für Erziehung und Unterricht* (Federal Institute for Education and Instruction) at Stuttgart.

1998

Printing and marketing is taken over by the AULIS publishing house.

1996-2001

The KPK is evaluated in a PhD theses at the IPN (Leibniz Institute for Science and Mathematics Education).

2004

Accreditation of the lower secondary KPK books in Baden-Württemberg; ideas of the KPK enter the new education standards; text books of other authors take over KPK ideas.

2004-2010 The KPK is translated into english, italian and chinese language [1].

The issue “KPK – DPG” (German Physical Society)

2013 February 15

The author of the KPK receives a report from DPG which emphatically recommends not to use the KPK for teaching. The author is informed that the report will be sent to the ministries of education of the German federal states. The DPG “experts” argue that KPK contains substantial errors. The author is invited to write a response within two weeks.

The report is published on the DPG web site immediately, i.e. before the dead-line for the response by the author.

In his answer, the author shows that none of the allegations is justified; on the contrary, the report contains several scientific errors [2].

DPG replies to the author’s response: They do not see any reason to change anything of the report. They do not make any reference to the literature given by the author, which supports the authors views.

A great number of protesting letters are written by university professors and school teachers and sent to DPG. Some of them are published on the KPK web site [3].

2013 March 1

In a letter DPG urges the ministries of the Federal states to forbid the KPK for the physics education at schools.

Notice that the market share of KPK has always remained below 1 %.

Notice also that DPG never has investigated any of the traditional marketable school books.

2013 April 4

The publisher (AULIS Verlag) informs the author that the cooperation is terminated. There will be no new editions of the KPK books.

2013 April 9

DPG publishes complementary remarks to the original report. The allegations are slightly changed. The report contains some mathematics, suitable to intimidate the reader.

Allegations against KPK and replies by the author

General remark

The KPK does not contain any idea that cannot be found in the commonly accepted literature. This literature is cited in my reply to the DPG.

In my view, the critique of the DPG is formulated in a somewhat abstruse manner. In the following I try to resume the main arguments.

DPG: The KPK mechanics introduces momentum flows. There is not such a current in nature. ("Es gibt diesen Strom in der Natur nicht.")

Reply: The concept had been introduced in 1908 by Planck [4]: "As the constancy of energy entails the concept of an energy flow, the constancy of the quantity of motion necessarily entails the concept of the flow of the quantity of motion, or for short the 'momentum flow'."

After 1908 it can be found in physics text books, as for instance in Landau-Lifshitz [5]. Its potential for the teaching of beginners was seen in the 1970s by ourselves [6] and independently by diSessa [7].

DPG: The KPK identifies heat and entropy.

Reply: Not true. The KPK says that the word "heat" of the everyday language corresponds better to the physical quantity entropy S than to the physical quantity dQ .

DPG: The KPK introduces magnetic monopoles

Reply: Not true. The KPK operates with the physical quantity magnetic charge, which can be introduced independently of whether there are isolated particles that

carry magnetic charge or not. Magnetic charge was already introduced by Maxwell and is also introduced by many text books.

References

[1] The Karlsruhe Physics Course

in english:

http://www.physikdidaktik.uni-karlsruhe.de/publication/pub_fremdsprachen/englisch.html

in italian:

http://www.physikdidaktik.uni-karlsruhe.de/publication/pub_fremdsprachen/italienisch.html

in chinese:

<http://www.seph.com.cn/seph/index.asp>

[2] Reply of the author to the DPG report

http://www.physikdidaktik.uni-karlsruhe.de/kpk/Fragen_Kritik/Entgegnung_DPG.pdf

[3] Protest letters against DPG attack

http://www.physikdidaktik.uni-karlsruhe.de/kpk/Fragen_Kritik/Fragen_Kritik.html

http://www.physikdidaktik.uni-karlsruhe.de/kpk/Fragen_Kritik/Reaktionen_auf_DPG-Schreiben.html

[4] *M. Planck*: Physikalische Zeitschrift, 9. Jahrgang, Nr. 23 (1908), S. 828

[5] *Landau, L. D., Lifshitz, E. M.*: Fluid mechanics, §7 Momentum flux, Pergamon Press

[6] *Herrmann, F.*: Mechanik – Abriß einer Neudarstellung, Konzepte eines zeitgemäßen Physikunterrichts, Heft 3, Hermann Schroedel Verlag, Hannover (1979), S. 80-87.

[7] *DiSessa, A.*: Momentum flow as an alternative perspective in elementary mechanics, Am. J. Phys., Volume **48** 365-369 (1980)