

THE PRINCIPLE OF PERMANENCE OF FORMS

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We discuss the role of a heuristic principle known as the *Principle of Permanence of Forms* in the development of abstract algebra. We try to find some analogies in the development of modern formal logic. Finally, we add a few remarks on the use of the principle in question in mathematical education.

George Peacock's *Principle of Permanence of Equivalent Forms* was formulated shortly as follows: *Whatever algebraic forms are equivalent when the symbols are general in form, but specific in value, will be equivalent likewise when the symbols are general in value as well as in form.* ([2], 59)

Hermann Hankel also formulated a similar principle (*das Princip der Permanenz der formalen Gesetze*): *Wenn zwei in allgemeinen Zeichen der arithmetica universalis ausgedrückte Formen einander gleich sind, so sollen sie einander auch gleich bleiben, wenn die Zeichen aufhören, einfache Grössen zu bezeichnen, und daher auch die Operationen einen irgend welchen anderen Inhalt bekommen.* ([1], 11)

It seems that the principle of permanence of forms was considered as a (heuristic) rule warranting that the development of mathematics should be secured from potentially nonsensical attempts at generalizations which could introduce objects with “strange” properties too much different from standard (normal, natural) properties.

REFERENCES

- [1] H. Hankel, *Vorlesungen über die complexen Zahlen und ihre Funktionen. I Teil: Theorie der complexen Zahlensysteme insbesondere der gemeinen imaginären Zahlen und der Hamilton'schen Quaternionen nebst ihrer geometrischen Darstellung.* Leopold Voss, Leipzig, 1867.
- [2] G. Peacock, *A treatise on algebra* (second edition, volume II). J.J. Deighton, Cambridge, 1845.

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