

A Note on the Origin of the Parameter Q in Electromagnetism

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Lady Jeffreys (1985) raises an interesting question in her paper 'A Q -rious tale: the origin of the parameter Q in electromagnetism'. She must be correct in assuming that Q originated in 'lumped' circuit theory and it is highly probable that it was first used in radio engineering. Certainly by the end of the 1930s, Q meters, direct reading instruments for measuring the magnification of tuned circuits, were to be found in well-equipped radio receiver design laboratories.

It also appears probable that the name Q was first adopted in the USA. An article by Lanterman (1933) on 'Combined Circuits of L, C and R' in the first edition of the *Radio Engineering Handbook* uses the symbol Q ($= \omega L/R$ and called the dissipation factor or constant) throughout although the authors of the other articles do not mention it. An even earlier reference to Q occurs in *Principles of Radio* by Henney (1929):

The manner in which the expression $L\omega/R$ of a coil, sometimes called its ' Q ', varies over the range is plotted in Fig. 101. Knowing this factor for the coil in a series or shunt circuit we can calculate the width of the frequency band at a point where the current is 0.707 of its resonant value, we can plot a resonance curve, and we can calculate the equivalent impedance of the circuit at resonance to a generator which must feed current into it (p. 145).

Apart from a somewhat garbled mention on page 311 the symbol Q is not used in any other part of the book and it is not indexed. I have made some spot checks of contemporary papers in the *Proceedings of the Institute of Radio Engineers* but have found no instances and it was certainly not generally used at that date, even in the USA.

There is a further line of investigation which could be worth following: in the Preface of his book Henney states that 'considerable material has been taken from "Radio Broadcast" ' and it could be that an earlier mention of Q might be found in that journal (which was published over the years 1922 to 1930 in Garden City, New York). Unfortunately it does not appear to be held in any of the main libraries in the UK.

REFERENCES

- Henney, K., 1929. *Principles of Radio*, Wiley, New York.
 Jeffreys, B., 1985. *Q. Jl R. astr. Soc.*, 26, 51.
 Lanterman, W.F., 1933. In *Radio Engineering Handbook*, p. 104, ed. Henney, K., McGraw-Hill, New York.