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On the concept of perfectness by Macaulay. (English) [Zbl 0926.13001](#)

Simis, Aron (ed.) et al., Commutative algebra. Proceedings of the workshop, ICTP, Miramare-Trieste, Italy, September 14–25, 1992. Singapore: World Scientific. 18-35 (1994).

From the paper: Perfect ideals \mathfrak{a} in polynomial rings $R = K[x_0, \dots, x_n]$ over an infinite field K were introduced by F. M. Macaulay as early as 1913 and subsequently in 1916 and 1933. The basic idea of Macaulay is to define perfect ideals in terms of certain homogeneous bases (h-bases). One of the important contributions of *W. Gröbner* in his book: “Moderne algebraische Geometrie” (1949; [Zbl 0033.12706](#)), was to put the notion of a perfect ideal into a more clearly defined setting, which perhaps enabled the so called Cohen-Macaulay ideals and modules to take their prominent position in modern day commutative algebra and algebraic geometry.

The original definition of a perfect homogeneous ideal, in terms of generating sets, by *F. S. Macaulay* [*Proc. Camb. Philos. Soc.* 30, 27-46 (1934; [Zbl 0008.29105](#))] is reexamined and shown to be equivalent to three other definitions. Various applications and an extension to the Buchsbaum property in some instances are given.

For the entire collection see [[Zbl 0913.00030](#)].

MSC:

- [13A15](#) Ideals and multiplicative ideal theory in commutative rings
- [13F20](#) Polynomial rings and ideals; rings of integer-valued polynomials
- [13-03](#) History of commutative algebra
- [01A60](#) History of mathematics in the 20th century

Keywords:

perfect homogeneous ideal; Buchsbaum property