

Berwick, William Edward Hodgson | Encyclopedia.com

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(*b.* Dudley Hill, England, 11 March 1888; *d.* Bangor, Wales, 13 May 1944)

mathematics.

Berwick's total output of original work is relatively small (thirteen papers and a monograph), due in part to ill health, and is concerned primarily with the theory of numbers and related topics, including the theory of equations. A penchant for problems involving numerical computation is reflected throughout his publications.

Much of Berwick's work is concerned with the following problem: Given a simple algebraic extension of the rational field, establish methods for computing its algebraic integers and the ideals they form. In the monograph *Integral Bases* (1927) Berwick made his most significant contribution to the resolution of this problem by developing methods for constructing an integral basis for the algebraic integers in such a field. The theoretical existence of integral bases is easily established but does not afford a practicable computational procedure. Methods for special cases—such as quadratic, cubic, and cyclotomic fields—had already been devised, but Berwick was the first to attack the much more formidable problem of developing methods that would apply to simple algebraic extensions in general. Although his method is not workable in certain exceptional cases, it possesses a wide range of applicability. Its strong numerical orientation, however, kept his work outside the mainstream of developments in algebraic [number theory](#).

Berwick also obtained a necessary and sufficient condition that the general quintic equation be solvable by radicals in the field of its coefficients (1915), and was instrumental in bringing about the publication of tables of reduced ideals in quadratic fields by the British Association for the Advancement of Science (1934).

BIBLIOGRAPHY

Further information on Berwick is in H. Davenport, "W. E. H. Berwick," in *The Journal of the London Mathematical Society*, **21** (1946), 74–80, which contains references to all of Berwick's scientific work. See also the notes by Davenport and E. H. Neville in *Nature*, **154** (1944), 265, 465.

Thomas Hawkins