

BULLETIN OF THE
AMERICAN MATHEMATICAL SOCIETY.

THE PUBLISHED AND UNPUBLISHED WORK OF
CHARLES STURM ON ALGEBRAIC AND
DIFFERENTIAL EQUATIONS.

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BY PRESIDENT MAXIME BÔCHER.

CHARLES Sturm was born in 1803 at Geneva, then a part of France, and went to Paris at about the age of twenty-one. There he spent the rest of his life and died in 1855, having become a member of the French Academy of Sciences in 1836.

It is not necessary for us to go beyond this bare outline of Sturm's life, since it is not with his worldly fortunes that we shall be concerned. Neither do I propose to give an account of his life-work as a whole.* The brief biography and bibliography prefixed to his posthumous *Cours d'Analyse* fulfills to some extent both of these purposes. We shall confine ourselves to one branch of investigation pursued by Sturm: the study of the real solutions of algebraic equations and of linear differential equations, both ordinary and partial. It was here that Sturm's most important and suggestive work was done, and it is of interest to try to gain some insight into the relations between the various parts of the subject as they appeared to him.

The papers with which we are concerned may be exhibited in the following table:

* In brief we may say that, besides the investigations with which we shall be concerned, Sturm published

(a) An experimental memoir in collaboration with Colladon on the compressibility of liquids.

(b) A large number of minor papers, mostly geometrical.

(c) Several papers on geometrical optics including a long memoir.

(d) Some papers, partly in collaboration with Liouville, on the imaginary roots of equations, which are not without connection with Sturm's work on the real roots of algebraic equations.