

STUDIES IN THE HISTORY OF COMPLEX
FUNCTION THEORY II: INTERACTIONS AMONG
THE FRENCH SCHOOL, RIEMANN, AND WEIERSTRASS

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Introduction. In most of the more recent books and monographs on the history of mathematics, the chief founders of function theory, Cauchy, Riemann and Weierstrass, are contrasted with each other. It is often claimed, for instance, that their ideas and methods long remained without mutual influence and were entirely unified only at the beginning of the twentieth century.¹ But if one consults earlier works standing somewhat closer to the time period in question, one finds them less inclined to make such claims. For example, in his *Vorlesungen über die Entwicklung der Mathematik im 19. Jahrhundert*, Klein characterizes Riemann as follows: "After all, any rigid one-sidedness is completely foreign to Riemann; he makes use of whatever he comes upon and applies the most diverse methods, whenever he can thereby advance and clarify his problem" [59, p. 254].² One may thus inquire whether the above-mentioned interactions among the three function theories did not indeed begin much earlier, perhaps as far back as the time of Riemann himself, of what intensity these were at that time, and whether one can still detect specific influences on the basis of source materials from that time.

Since 1977 I have been occupied with particular aspects of these questions (see the series of articles [80 – 85]). I have been able to show, among other things, that Riemann knew and utilized the decisive works of the French mathematicians even before his promotion (cf. [85]). In this article I propose to set out the broad outlines of the interactions among the three theories and briefly to cite the most important sources in each instance. For a more detailed description of the mathematical development of the three theories, one may consult [31], [38], [59], [60], [69], [72], [78], [84], [114]; for further information on the interactions, [9], [31], [75]; and also those parts of my biography on Riemann which have already been completed. In what follows I will chiefly use the edition of selected letters from Riemann to his family (91 letters, 1836–1864, in [104]), as well as the list of Riemann's books borrowed from the University Library at Göttingen (over 500 items from 1846–1866), both to be published in my biography.³

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¹Cf., e.g., [60, p. 669], [65, p. 194] and [69, pp. 358 f.].

²Klein relies here, presumably, on information communicated in a letter from Prym in 1882, which arose in connection with his research on the origins of the Riemannian function theory (cf. [58, p. 479] and note 18).

³The relevant parts are available in the form of a preprint from the author (cf. also [86]). For a photographic reproduction of a page of the University Library records of books borrowed see [87].