philosophical and classical spirit. During these twenty-five years Gauss lived and soared in solitary height—a name only to the German student, as Euler had been before him. Probably he was better known to the younger astronomers whom he trained, and the elder ones with whom he corresponded. But astronomy was not then within the pale of the universities. To what extent the character of Gauss's own genius was the cause of this it is difficult to say.[1] He himself had not come under the influence of any great teachers such as Paris then possessed; he was self-taught, and had early imbibed a great admiration for the methods of Euclid, Archimedes, and Newton; he wrote in the classical style fitted for all times, but not for uninitiated beginners.[2] It is certain,

[1] Bjerknes, in his most interesting memoir on Abel, refers frequently to the awe in which Gauss was held by younger mathematicians.

[2] In this Gauss resembled Newton. He was therefore, like Newton, frequently forestalled by others, who published his new methods and ideas in an unfinished and fragmentary form; whereby it is not suggested that these simultaneous discoveries or inventions were not quite independent. Two examples of this may be added to those given above. When Gauss published the 'Disquis. Arith.' in 1801, he left out the last or eighth section, which was to treat of the residues of the higher orders. He had already nearly completed the theory of biquadratic residues. In dealing with this subject he had found it necessary to extend the conception of number beyond the limits then in use. If we confine ourselves to integers, the only extension which then existed of the notion of number was in the use of negative numbers. These were counted on a straight line backward, as positive (or ordinary) numbers were counted forward. Gauss conceived the idea of counting numbers laterally from the straight line which represented the ordinary—positive and negative—numbers. He called numbers which were thus located in the plane "complex numbers," as they had to be counted by the use of two units, the ordinary unit 1 and a new unit i. He also showed that this new unit i stood in such relations to the ordinary unit 1 as were algebraically defined by the mysterious imaginary symbol $\sqrt{-1}$. The complete exposition of this new or complex system of counting was not explained by Gauss till the year 1831, when he published the 'Theoria residuorum biquadraticorum.' In the meantime the geometrical representation of imaginary quantities had been devised and published by Argand (1806), but not being employed for such important researches, it had re-