PROFESSOR BÔCHER'S VIEWS CONCERNING THE GEOMETRY OF INVERSION.

BY PROFESSOR EDUARD STUDY.

In a recent paper (this BULLETIN, volume 20, pages 185–200, January, 1914), Professor M. Bôcher sets forth what he thinks are sound principles for dealing with geometry, and more especially with the geometry of inversion. Herein I am glad to agree with him. The same and similar principles have been expounded, and applied, in a less elementary (but more comprehensive) manner by myself. Professor Bôcher's article may be looked upon as commenting on the import of the conception of *natural continua* introduced by me in 1903,* though he makes no use of this notion itself.

There seems to be, however, little agreement in other respects. Professor Bôcher quotes one of my articles ("Das Apollonische Problem," *Mathematische Annalen,* volume 49, 1897), merely stating that it is long and yet does not contain a word concerning the "region at infinity."† The first of these assertions is right as a matter of course, assuming a suitably chosen standard of length, and as to the second I will not quarrel with my critic. What I am concerned with is merely the inference which the author leaves to his readers. This inference would appear to be that I had been thoughtless, or careless, or regardless enough to publish my results in an embryonic state of development. It will inevitably be understood that all my theorems are "true in general" only, and consequently incorrect. I am found guilty of having committed an error to which, in recent years, I have myself objected often and strongly. I am caught in my own trap, and no mistake. There will be possibly some people who will enjoy this. But it cannot reasonably be expected that I should be one of their number. Therefore I beg to point out a few trifling circumstances that apparently have not been appreciated by my critic.

1. Let us supply the missing (but certainly indispensable)

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* In my book, Geometrie der Dynamen, §§ 27, 28. This seems to have escaped Professor Bôcher's notice. He might have been aware of it, though, for he found a reference in connection with his own topic in a paper by H. Beck.

† Bôcher's own term is "the infinite region."