

the potential function. It contains some valuable suggestions and pertinent remarks on the legitimate use of higher complex number systems. It is shown that the analytic continuation through the bicomplex domain, for instance, cannot yield anything new for the ordinary complex domain which cannot also be obtained by analytic continuation in the latter domain.

On the other hand it is pointed out that certain systems of complex quantities, which do not obey the commutative law of multiplication have been particularly useful for the applications in the theory of groups and in geometry. "Accordingly we must beware of any kind of dogmatism. Science disregards artificial restrictions and acknowledges only its own laws, but no authorities."

In conclusion it is shown that the entire projective geometry in space may be interpreted in the euclidean plane by means of the real point couples or pictures. A number of suggestions are also made, how the methods used by the author may be extended to space.

The little book, on the whole very carefully prepared, thus proves very profitable reading and suggestive for further research.

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*Vector Analysis.* By J. G. COFFIN. Second edition. Wiley and Sons, New York, 1911. 12mo. xxii+262 pages. \$2.50.

THE first edition of this book was reviewed in this BULLETIN, volume 17 (1910-11), page 101. The present edition differs little from the first, the important additions occurring in the examples and the appendices. Some few errors have been corrected, and a few statements reworded. Thus, we find the definition of vector now given as follows: "A vector is a directed segment of a straight line on which are distinguished an initial and a terminal point." Exactly what this new definition means, is hard to see. The last clause is superfluous if the main clause means anything, for a segment necessarily has end-points, and if "directed" one end is necessarily initial and the other terminal. Why the end points are specially important is not made clear. Further, the term vector as used in the text does not mean a segment of a straight line, but any one of an infinity of parallel segments of the same currency. It would therefore seem better to