50). Then one has a transformation of an element s, or system S, *into* an element $\varphi(s)$, or a system $\varphi(S)$, and also (page 56) a transformation of S *in* Z. [The latter denotes a transformation of S into $\varphi(S)$, a part of Z.] This use of the word transformation is not easily associated with its ordinary use. The translation "representation" for Abbildung has been used by others By its adoption, the language becomes very smooth. Then, under the representation φ, a system S is represented by $\varphi(S)$. If the latter is a part of a system Z, we have a representation of S in Z.

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L. E. DICKSON.

Annuaire pour l'An 1902, publié par le Bureau des Longitudes. Paris, Gauthier-Villars.

THE Annuaire for the year 1902 does not differ materially from its predecessors. The information on the various subjects which it treats is, as usual, brought up to date; otherwise the body of the volume contains no material changes. The only matters which call for special remark are the notices placed at the end of the volume. The committee which has charge of the Annuaire always chooses subjects for these notices which shall be scientific and of general interest. The current Annuaire is no exception to the rule.

M. Poincaré writes a luminous article of thirty-four pages, on wireless telegraphy. He gives a simple account of the main principles which underlie this latest development in the applications of electricity. As usual, he carries the reader by easy stages up to the most recent results, including those of Marconi, so far as they are known.

M. Cornu develops, with much detail, the theory and practice of polyphase currents. Some parts of this article will perhaps be a little tedious to the mathematician, as several pages, here and there, are devoted to elementary explanations of harmonic motion, and the composition of harmonic motions of the same phase and different amplitudes; but this is doubtless an advantage for many of the readers whom this volume reaches. Considerable space is devoted to the construction of the most modern forms of dynamos.

In the third appendix M Guyou makes a plea for the use of the decimal division of the angle. He admits that it is hopeless to ask astronomers to change from the degree to