DISCUSSION ON "THE CURRENT LOCUS OF THE SINGLE-PHASE INDUCTION MOTOR." FRONTENAC, N. Y. JUNE 28, 1909

V. Karapetoff: Professor Langsdorf says that he was induced to write this paper because of certain difficulties that he met with in teaching students. I should like to make one slight criticism from a pedagogical point of view. It appears that Professor Langsdorf wanted to get closer to the physical phenomena, and therefore he discarded Ferraris' assumption of two fields revolving in opposite directions. But he introduced another assumption which, while it may be clear to us, is by no means self-evident to the beginner. I refer to the diagram in Fig. 1. He replaces the squirrel-cage rotor by a direct-current armature, or rather by an armature such as is used in some single-phase commutator motors, with two sets of brushes at right angles to each other. These sets of brushes are intended to fix in space two fluxes, the transformer flux and the motor flux, as in the single-phase induction motor. The substitution is hardly justifiable from a pedagogical standpoint. A beginner would not see the equivalence of the two armatures directly. Moreover, this substitution is hardly necessary; for it could just as easily be explained to a beginner that the squirrel-cage rotor, when placed in a motor at rest, would act as the secondary of a transformer; that the same squirrel-cage rotor, if revolved in a constant field, would be equivalent to an apparatus whose field is stationary in space. In this case the flux is in a horizontal direction; that is, along the axis ff . For these reasons I think that the substitution of the armature with the commutator for the squirrel-cage rotor is unnecessary. Moreover, it is not quite correct. The squirrel-cage secondary adapts itself electromagnetically to the primary flux, because of the possibility of currents in various bars differing from one another: the equalization is accomplished through the end-rings. In the coil-wound armature, on the contrary, currents in all the coils must necessarily be the same, since the coils are connected in series. Therefore, the student may get a wrong impression, especially with regard to magnetic leakage.

The multistage formula (9) looks complicated because Professor Langsdorf uses reactances and resistances instead of admittances. As I understand it, the only reason is that he wishes to introduce the slip or speed, S . Could not the results be presented in a shape more comprehensive to a student by substituting admittances for impedances? In this case there would not be any stages, but an ordinary addition of terms.

A. S. Langsdorf: In reply to Professor Karapetoff's criticism of the form of Fig. 1, I may say that it has been my practice in class-room work to use both methods suggested by him, but it did not seem necessary to go into such detail in the present paper.

In deriving equation (9) there is little or nothing to be gained in the way of simplicity by using admittances exclusively; the form given in the paper lends itself readily to the determination of Fig. 6, from which the remainder of the work follows directly.