DISCUSSION.

John Stone Stone: It seems that practically the entire difficulty experienced by Mr. Simon in his experimental work arose from the irregularity of the spark discharges. Their regular sequence was disturbed by the over-lapping of the wave trains in the secondary circuit and by the reaction from the secondary on the primary circuit. To overcome these troubles, it was necessary to insert resistance in the aerial circuit, thereby increasing the damping of the wave trains to such an extent that the reaction of the secondary on the primary ceased until after the primary circuit current had been quenched. I desire to add, however, that the proper form of resistance to insert in an aerial for the purpose mentioned would be a carefully designed spark gap, of low resistance to high currents, but of high resistance to low currents.

The reason for the use of this form of resistance is that it would effectively eliminate the tail end of each wave train without seriously affecting the initial portions thereof. Since there is but little practically usable or sound producing energy at the end of the wave train, it is just as well if it is eliminated.

Guy Hill: In line with the suggestions of Mr. Simon regarding the overlapping of the wave trains in the antenna and the reaction of the aerial circuit on the closed circuit and of Mr. Stone's suggestion relative to the introduction of a spark gap as a resistance in the aerial circuit, I may mention that if by the introduction of such a gap, the reaction is appreciably diminished it might be well to adopt such measures, even in the case of single phase 500 cycle sets operating at very long wave lengths. This matter may well be worth going into.

John L. Hogan, Jr.: It has been suggested that if 60 cycle current were available, it would be possible by the use of a three phase transformer to obtain 360 sparks per second with the advantages of a high note at the receiving station. The National Electric Signaling Company has a very similar case to this in practice, at the New London station.

There we had 60 cycle, three phase current supplied. We thought of using there a three phase set, thereby getting a high frequency spark, but the simplicity and cheapness of installing a non-synchronous rotary gap giving musical spark of some 600 groups per second made the more complicated three phase set not worth considering.

Aside from the possibility of securing sustained waves, or radiation with very high train-frequency, for radio telephony or pure-note heterodyne operation, the only commercial use I can see for a three phase system is in very powerful stations for sending over long distances. It is possible that the triplication of parts necessary will be more than balanced in operating and first costs by the saving in the purchase of a 120 cycle, three phase or 60 cycle, three phase standard alternator instead of a 360 or 180 cycle special machine. This is speculative, however, and I am inclined to doubt the economic value of any multiphase system I have studied, especially when the trend toward sustained-wave and heterodyne operation is taken into account.