## Interpretation of Virus-induced Changes in the Shape of Hemagglutination-Inhibition Curves with Egg-White Inhibitor

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The authors have recently presented a hypothesis to account for the striking changes that occur in the shape of the hemagglutination-inhibition curve when egg-white inhibitor is treated with certain active influenza viruses (*1–3*). The basic postulate of this hypothesis is that inhibitor is inactivated in a progressive rather than all-or-none manner by virus, with a resultant progressive decrease in its affinity for virus. In certain situations (*2*) the inhibition curve of partially modified inhibitor presented a two-step character, which appeared to necessitate the auxiliary postulate that the virus employed in the titrations was heterogeneous with respect to affinity for modified inhibitor. In this interpretation the plateau which occurred at intermediate levels of inhibition was taken as a measure of the fraction of the total virus which was poorly inhibited. Occasionally, there was observed a dip in the inhibition curve, occurring immediately before the steep terminal rise (*2*). Because of the usually small magnitude of this effect in relation to the experimental error, no explanation of it was attempted.

Studies now in progress have confirmed thus far the basic notion of a progressive action, but have cut away the foundation for the auxiliary postulate. A slight increase in the precision of measurement, gained through several technical refinements, which included the substitution of a photoelectric densitometer (modeled after that of Hirst and Pickels [*4*]) for the visual method of reading previously employed, has enabled us to demonstrate that the dip is a real experimental feature, although it may not always appear. From Fig. 1, which illustrates results of titrations carried out with the densitometer, it is easy to see how a slight loss of precision could lead to the erroneous interpretation of a shallow optimum as a plateau.

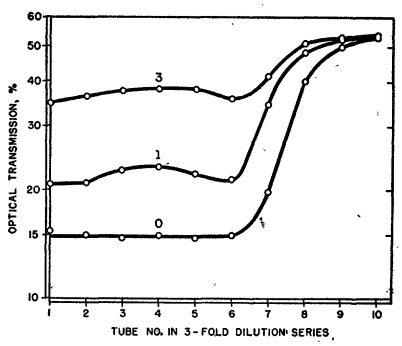


FIG. 1. Hemagglutination-inhibition curves of semipurified egg-white inhibitor after treatment for 0 (control), 1, or 3 hr at 26° C with dialyzed active swine influenza virus in allantoic fluid. The virus-inhibitor mixtures were heated (2 min, 100° C) to destroy the virus and titrated by the method of inhibitor-dilution against 3.5 hemagglutinating doses of heated (30 min, 53° C) virus. A transmission of 15% corresponds to that of a 1% suspension of chicken erythrocytes and denotes complete inhibition of the titrating virus. A transmission of 55% is the maximal value, obtained in the absence of inhibitor. For details of methods, reference is made to previous reports (*1, 2*).

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In experiments stimulated by these findings, the controllable factors have been manipulated in an effort to delineate the origin and evolution of the phenomena under discussion. The available results point to the optimum and the dip as the consequences of the operation of several processes which differ in direction (for or against hemagglutination) and rate; however, no completely satisfactory explanation has as yet emerged.

### References

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## Fundamental Role of the Tone and Resistance to Stretch of the Carotid Sinus Arteries in the Reflex Regulation of Blood Pressure[1]

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It has been shown (*1*) that external local application to the arteries of the carotid sinus areas of epinephrine, norepinephrine or pitressin induces a stimulation of the carotid sinus pressoreceptors and thus a marked and prolonged reflex fall of the systemic arterial pressure and a suppression of the normal hypertensive response to decrease of pressure in the carotid sinus. Local application of drugs such as papaverine or Priscoline provokes, on the contrary, a decrease of stimulation of the carotid sinus pressoreceptors and thus a reflex rise of the systemic arterial pressure. From these experiments it has been concluded that drugs contracting the arterial wall where the pressoreceptors are located stimulate these receptors, whereas drugs relaxing the arterial wall of the carotid sinus induce a decrease of stimulation of the pressoreceptors and thus a decrease of the activity of the carotid sinus nerves which by reflex action moderate the systemic arterial pressure. These experiments also show that the tone and resistance to stretch of the arterial wall where the pressorecep-

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