Sutton's equations were intended for gaseous effluents but may be applied to particulate emissions in which the particle sizes are of hygienic significance. Studies by Baron, Gerhard and Johnstone [2] show that even for aerosols with particle diameters up to 20 to 50 microns the shape of the Sutton curve is not significantly affected.

FIELD APPLICATIONS OF SUTTON EQUATIONS

EXAMPLE 1.—One of our plants is located in a highly industrialized area. In common with a number of others, it processes material A, some of which is emitted to the atmosphere. There were complaints of air pollution, and it was necessary to determine whether our plant's emissions were contributing significantly to the pollution that was known to exist.

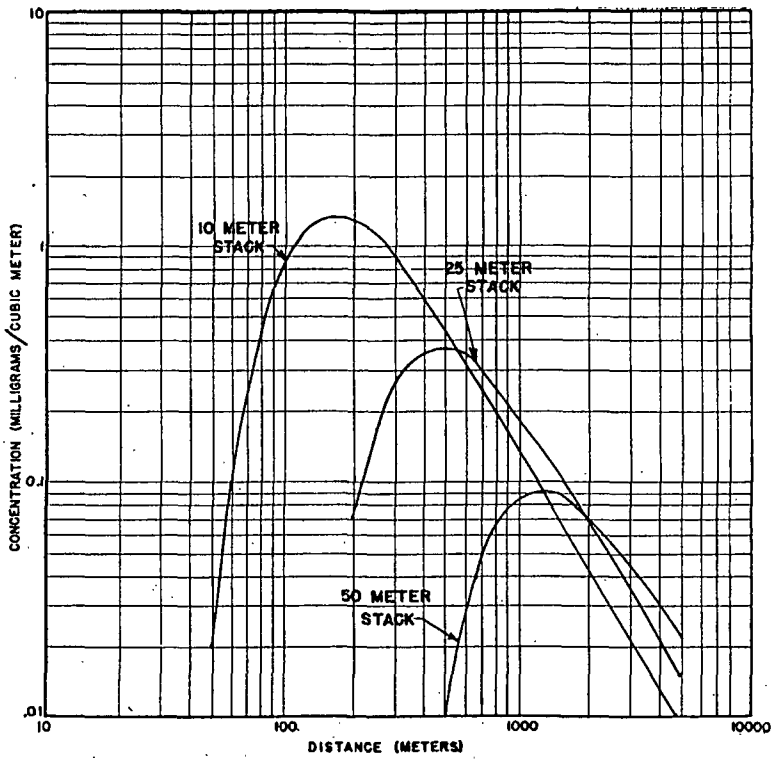

Fig. 3.—Calculated concentration downwind from stacks of various heights (after Sutton [1]). $Q = 1$ Gm./sec. $u = 1$ M./sec.

Our general approach was to collect simultaneous samples from our plant stacks and from three locations within 1 mi. downwind and one location upwind of the plant. If significant contamination was resulting from our operations, the following should be true:

1. The concentrations of material A collected downwind of the stack should approximate those predicted by equation 1.

2. Variations in concentrations downwind of the stack should correlate with variations in the rate of emission.

3. The concentrations at distances greater than 10 stack heights from the plant should diminish approximately in proportion to the —1.75 power of distance.

2. Baron, T.; Gerhard, E. R., and Johnstone, H. F.: Dissemination of Aerosol Particles Dispersed from Stacks, Indust. & Engin. Chem. **41**:2403, 1949.