Consistency may not be valued by reactionary politicians, but consistency is a virtue in science and a necessity in mathematics. Inconsistent equations can be manipulated to give almost any result. Inconsistent science produces different results in different labs, that resolve the inconsistency differently. Arguments, confusion, and slow progress are the result, at best.

Consistent treatments of diffusion are rare. Diffusion usually involves charged particles. Diffusion in water solutions and thus in biological solutions (that are always mixtures of Na+, K+, Ca2+ and Cl− almost always involves ions. Diffusion of ions is changed by electric forces, and electric forces are produced by diffusion of ions, according to the equations of the electric field, some version of Maxwell’s equations. Brownian motion that produces diffusion invariably involves fluctuations in the number density of ions, and thus in the number density of charge. The electric forces in a theory, model, or simulation of Brownian motion must calculate the electric field and allow it to fluctuate. Assumptions of a time independent electric field (in Brownian motion) or of a shape or size of an electric field (or profile of electrical potential) are inconsistent. It is not surprising that such treatments produce anomalies.