Chemical interactions, in the gas or liquid phase, ordinarily occur between mobs of molecules that wildly beget progeny. What can be reliably inferred about molecular-level processes is thus limited by averaging over myriad random collisions. This limitation has been overcome by molecular beam methods, allied with theory, that have revealed much about the intimate dynamics of single collisions between pairs of molecules. Several vignettes will be presented to convey the historical evolution and the present scope of these methods in chemical physics.