The cross section in Fig. 11.72 is locally balanced, based on the area-depth line (Fig. 11.72Aa). Note that the section has a sloping regional and so depth measurements are taken from the center of the structure (Fig. 11.72c). The predicted lower detachment is 0.2 km shallower than shown on the original interpretation (Fig. 11.72Aa,c), which is a significant difference. Examination of the seismic line on which the cross section is based suggests that the detachment is properly located. The possible changes that could produce better agreement illustrate the issues that must be considered in validating an interpretation. A change in the position of area-depth point T would produce a better match. Realistic changes in the depth to the regional of marker T are about ±0.1 km and will not produce much change in the predicted detachment depth, which means that the probable change is an increase in the excess area under marker T. The area of T could be increased by either changing the interpretation of the cross section or by lowering the position of the regional. The regional (Fig. 11.72Ac) seems consistent with the structure and so should probably not be changed. The T marker is below the regional at two locations. Reinterpreting the section to place the T marker entirely above the regional would increase the excess area by 0.16 km^2, also insufficient by itself to place point T onto the dashed line on the area-depth graph. The interval between marker 2 and T is greater in the duplex than outside it. A reinterpretation of the location of T to keep the interval constant (*red* in Fig. 11.72Ac) increases the excess area enough to place the predicted detachment slightly below the interpreted detachment (Fig. 11.72Ab,c). Thus if it is possible to change the geological interpretation, reinterpreting the position of the Trenton limestone is the most reasonable aspect to change.

Another aspect of the interpretation is the predicted strain. Based on the reinterpreted location of the Trenton, the requisite strains are T = –1.6%, 2 = –16.3%, 3 = –12.2%, 4 = –13.3%. The small value for the Trenton represents essentially constant bed length. The larger values for the shallower markers indicate significant sub-resolution layer-parallel shortening should be present, presumably in the form of small faults or folds. Bed length restoration of the cross section, as given, would falsely indicate insufficient bed length in the upper units.

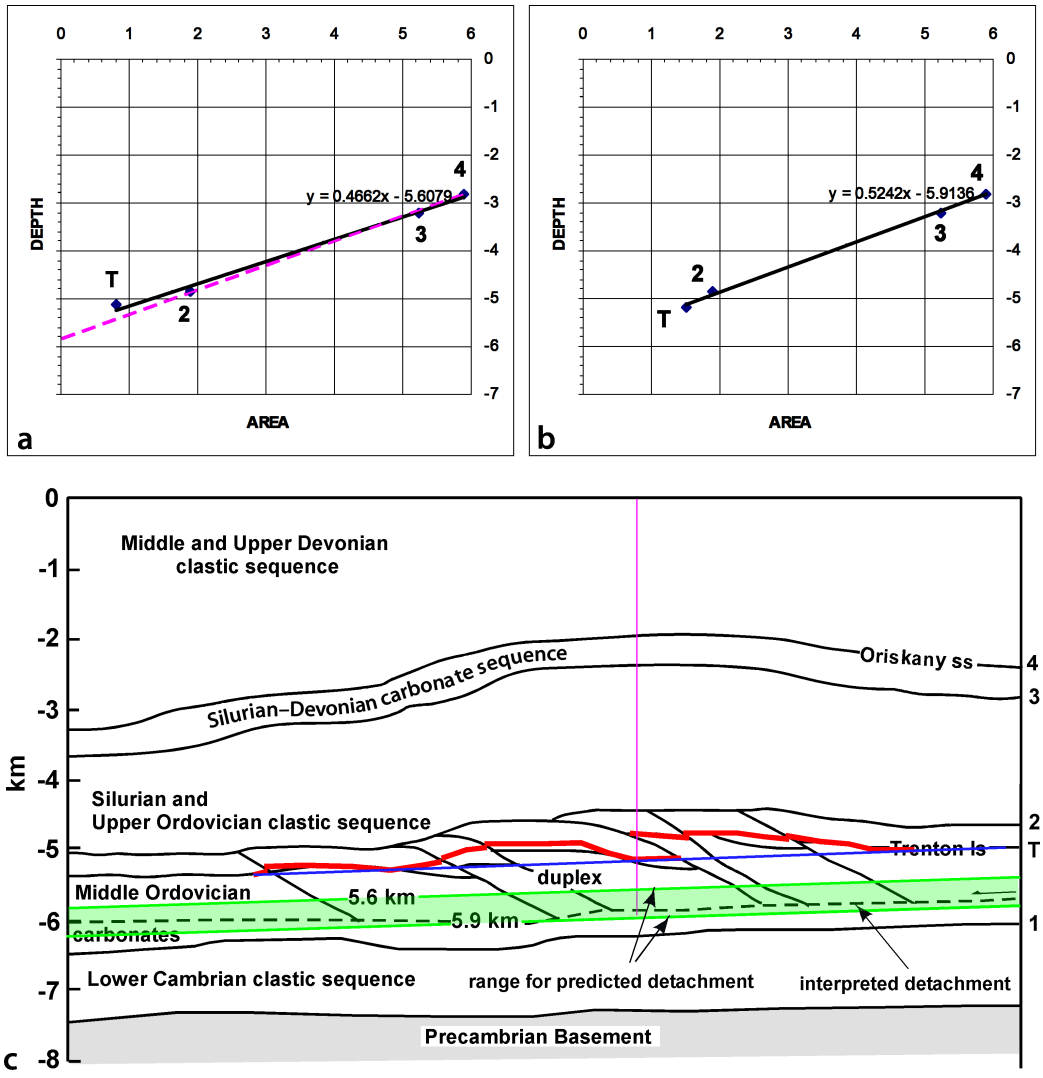

Fig. 11.72A. Area-depth interpretation of Deer Park anticline (from Fig. 11.72). **a** Area-depth graph in km^2 and km, respectively. *Heavy line* is least-squares best fit giving a predicted lower detachment at –5.6 km. *Thin dashed line* is drawn to intersect lower detachment at –5.8 km. **b** Revised area-depth graph based on reinterpretation of excess area of T, giving lower detachment at –5.9 km. **c** Cross section showing predicted and interpreted detachment levels. The Trenton (T) regional is *blue*; reinterpreted Trenton marker is *red*, predicted detachment levels are *green*; the *vertical purple line* is the location of depth measurements