



Figure 6. Diagrammatic section of igneous relations exposed in eastern Wichita as they existed at end of volcanism in Cambrian time and before deposition of Reagan Sandstone. Mid-Cambrian unconformity, now also a surface of intrusion, separates gabbros from rhyolites and granites. From Myers and others (1981, fig. 1).

unusually dense substrate. With gabbroic rocks plating the upper part of the crustal column for 4 or 5 km, buoyancy relations did not permit rhyolitic liquid to stop before reaching the surface. Thus, the granites mostly are thought to be hosted in their own ejecta, rather than gabbro. (Locally, gabbro is intruded by granite, but the argument here is for the regional scale.) This also accounts for the extreme sheet forms of the granites, wherein the Mount Scott Granite, for example, is at least 55 km in one horizontal dimension.

Final igneous activity is represented by a late diabase that cuts all other units (Ham and others, 1964). Although this unit is of small volume, it may in fact represent the largest pulse of basaltic liquid to enter the crustal columns (Gilbert, 1978d, 1982). This is because the estimated 40,000 km³ of rhyolite liquid must be generated ultimately by basaltic liquid. Because the mass of rhyolite is so large, and extends (or extended) out beyond the immediate boundaries of the gabbroic substrate that can be mapped, there is somewhere in the crustal column additional enormous masses of gabbro. This has two

immediate consequences: (1) the geophysical anomalies (magnetic and gravity) represent the combined effect of several different basaltic pulses (1, 3, and 4 of fig. 5) and so the gabbros cannot really be modeled as one lopolithic body, as Pruatt (1975) did; and (2) study of the chemistry of these late diabase bodies will be necessary to constrain petrogenetic models of the rhyolitic liquids.

Table 3 lists chemical data for two of the distinct types of basaltic liquid and for two of the rhyolitic liquid that have been identified. This is another way of noting the strong bimodality of the Wichita province. The Glen Mountains Layered Complex has not yet been characterized as to the original liquid composition. The Roosevelt Gabbros, however, are small enough so that judicious sampling (and averaging) may reasonably yield an equivalent liquid. This is the oldest composition listed. In comparison, the youngest is a newly averaged set of five late diabases, whose chemistry does not differ markedly from the Roosevelt Gabbros. An example of one of the earliest rhyolitic liquids, if not the earliest, is the Mount Scott Granite. It is also the most calcic. One of the youngest