



Figure 24. Major fault trends of Southern Oklahoma Aulacogen and surrounding areas of southern Midcontinent, with locations of COCORP traverse and Chevron regional seismic line. Shading patterns: diagonal stripes, granite and gabbro outcrops in Wichita Mountains; crosshatched, 1,370–1,400-m.y. old granites and granite gneisses of Arbuckle Mountains (Bickford and Lewis, 1979); dots, inferred minimum extent of relatively undisturbed Precambrian layering south of Wichita Mountains. W & T, location of Widess and Taylor (1959) seismic data recorded in Frontal Fault system of Wichita Mountains. These data were interpreted (Ham and others, 1964) to indicate extensive pre-Reagan Sandstone layered rocks under Anadarko Basin. These data might, however, represent thrusting along Wichita Mountain front, along moderately dipping faults.

RESULTS OF COCORP STUDIES

1. A Proterozoic basin inferred south of the Wichita Mountains.

This basin is inferred from pronounced, high-amplitude, laterally continuous and relatively undeformed layering in the Precambrian crust (fig. 26), seen on all COCORP data recorded south of the Wichita Mountains (Brewer and others, 1981). The layering extends over an area of at least 2,500 km² (based on the extent of COCORP data) and probably much more, and in places lies as deep as 13 km. The character of the layering suggests depositional processes, because there are suggestions of angular unconformities and onlapping and downlapping rela-

tionships, although other possibilities, such as layered igneous bodies (for example, Lynn, 1980), cannot be ruled out. If the depositional hypothesis is correct, the layering is most likely due to clastic sediments and felsic volcanics (probably metamorphosed to an unknown degree), since these rocks are widespread in the southern Midcontinent and in many areas are relatively undeformed (for example, Denison and others, 1981). Other rock types, such as basalts or carbonates, also could be present. A well drilled just south of the most southerly COCORP lines penetrated a micrographic microgranite porphyry, dated at $1,265 \pm 40$ m.y. (R. E. Denison, unpublished data), and farther north (for example, VP's 1–400 of line 1, fig. 26), Tillman metasediments lie at the top of the basement (inferred from pl. 1, Ham and