be partly accounted for by a possible small difference in angle of attack. Figure 7 (b) also includes the results of tests made before and after carefully polishing the midspan section of the model. The change in surface smoothness and a slight change in fairness had no discernible effect on the distribution; the differences were

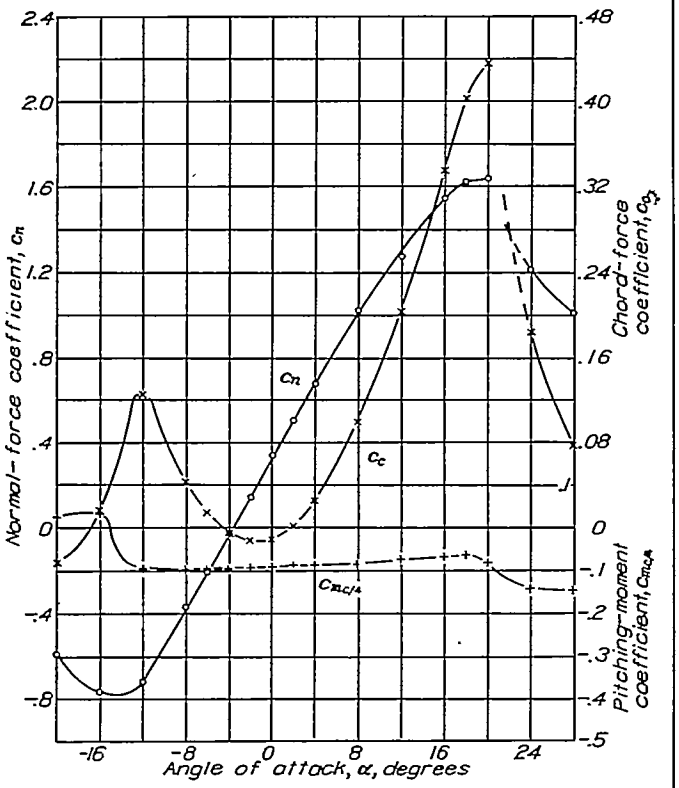

FIGURE 6.—Normal- and chord-force coefficients, and pitching-moment coefficients about the quarter-chord point. The numerical value of c_c should be prefixed by a minus sign.

less than those obtained by repeat tests of the same surface.

The determination of the effective angle of attack of the midspan section entails certain assumptions that are subject to considerable uncertainty. First, the angle of attack of this section may be in error because of the assumption that the deviation of the air-stream axis from the tunnel axis is uniform along the span of the model; i. e., that the geometric angle of attack α is the same for all sections along the span. Actually there is some variation of the air-stream direction across the tunnel. Because of the interference of the support struts, the deflection of the stream in this region might reasonably be expected to exceed the deflection at the midspan section; hence, the deflection at the midspan section is probably less than the effective mean value. Furthermore, a zero deflection of the stream at the midspan section would bring the angle of zero lift obtained from the pressure tests into agreement with force-test results.

A second and rather large source of error lies in the determination of the induced angle of attack. The method used probably produces erroneous results because of the fact that the tips of a rectangular wing carry a larger proportion of the load than is indicated by the theoretical calculations on which the method is based. To make an accurate experimental determination of the lift distribution on which to base the induced-angle calculations would require pressure measurements at several sections along the span, especially near the tips. An estimate can be made, however, of the possible error in the induced angles of attack given herein by comparison of the deduced slopes of the lift curve for infinite aspect ratio obtained from these tests and from the best force-test data available. Such a comparison indicates that the induced angle of attack may be approximately two-thirds of the calculated values given herein, which would mean a possible error of approximately ½° for a lift coefficient of 1.

It is evident, therefore, that the effective angles of attack are subject to a considerable error of uncertain magnitude. Approximate possible errors have been

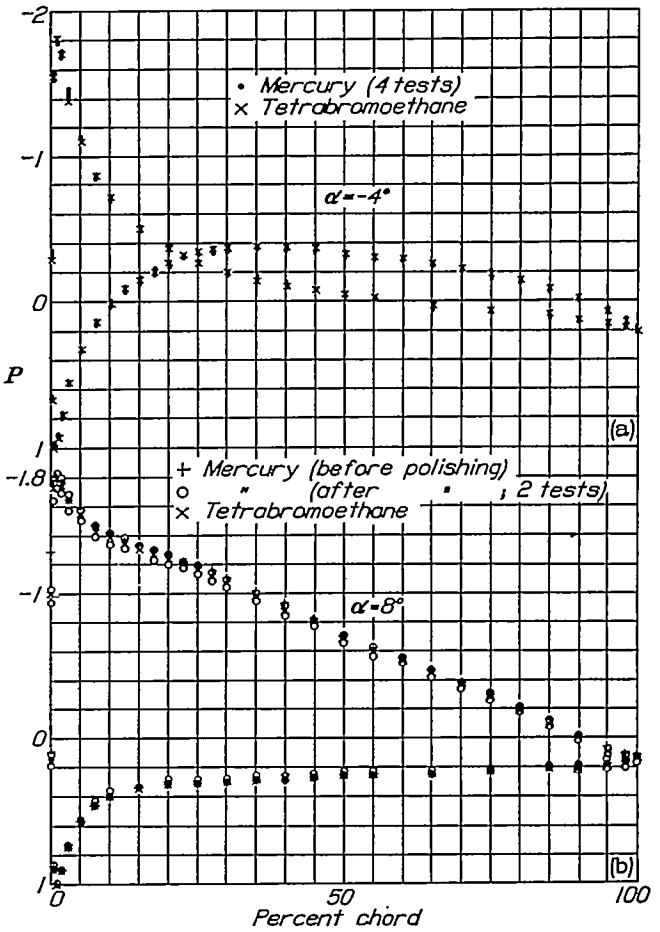

FIGURE 7.—Pressure-distribution diagrams from several tests at two angles of attack.

estimated and summarized as follows: The values of the angles as given may be too large by a constant error of approximately ¼° because of a possible error in the assumed direction of the stream. On the other hand, the angles may be too small by approximately $c_l/2°$, owing to the error in the induced-angle calculations.