truncated at $n = 2$. This also shows that M is the total mass enclosed by the ellipsoid, which thus is seen to be equal to the mass of the auxiliary mean sphere of radius R.

This is quite normal since any ellipsoid E and its associated mean sphere S (of radius q) enclose the same volume by the very definition (2–82), in view of (2–53) for $n = 2$: the mean deviation between E and S is zero. This holds for any ellipsoid of constant density, $q < R$, as well as for the boundary ellipsoid $q = R$, which we are considering in (2–92).

Internal potential. We shall use a similar artifice (Fig. 2.5) as for the sphere

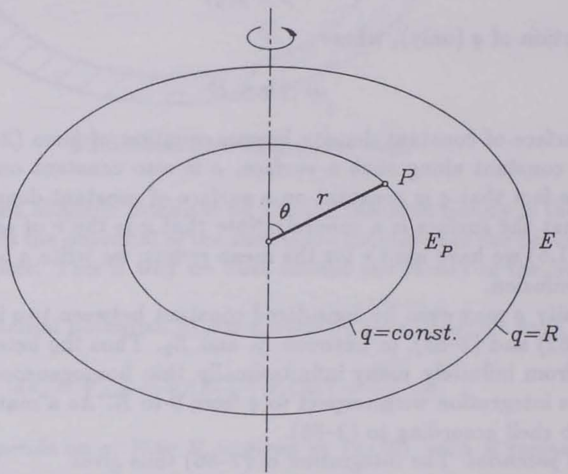

FIGURE 2.5: Illustrating the potential at an interior point P

(Fig. 2.2), considering the ellipsoid (= ellipsoidal surface) of constant density E_P passing through the interior point P at which the potential $V = V_i$ is to be computed. The ellipsoid E_P is characterized by its value q (the radius of the corresponding mean sphere); along E_P, the value of q is, of course, constant as we have already remarked. The equation of E_P is (2–82); r and θ are shown in Fig. 2.5.

Again we shall build up the potential by summing (integrating) the contributions of the infinitesimal shells bounded by ellipsoids of constant density as shown in Fig. 2.4. These contributions are given by (2–86) and (2–87). Since q has been reserved for E_P (Fig. 2.5), we shall denote the integration variable by q', similarly as we did for the sphere, cf. (2–47). For the interior of E_P, i.e. for $q' < q$, we take (2–86); for the shell between E_P and E, i.e. for $q < q' < R$, we take (2–87): P is external for the region inside E_P (being just on its external boundary E_P) and internal for the shell. Thus we get