inconsistent with the 2MASS data unless one adopts an extreme fit to the very reddest stars.

Berkeley 44 main-sequence members have intrinsic *J–H* colors of ∼0.15 or redder, indicating stars of earliest spectral type ∼F0, corresponding to turnoffs for intermediate-age clusters of age $\sim 10^9$ yrs. A variety of model isochrones near $\log t \simeq 9$ were therefore tested in the cluster color-magnitude diagram (Figure 4), with the optimum fit produced by an isochrone of $\log t = 9.3$, as shown, corresponding to a cluster age of ∼2 Gyr. The procedure involved use of the M_V versus *B–V* isochrones published by Meynet, Mermilliod, & Maeder (1993), adapted to the M_J versus *J–H* system with our empirical link between the *UBV* and 2MASS systems. An isochrone of the same age from Bonatto, Bica, & Girardi (2004) is also plotted in Figure 4, but deviates systematically in *J–H* from the Meynet et al. (1993) isochrone, suggesting a possible problem in the conversion from $\log T_{\rm eff}$ to *J–H* with the Padova isochrones used by Bonatto et al. (2004). A problem arises with stars in the red giant clump, since they are not replicated well by either set of evolutionary models used for the isochrones. Yet their colors are consistent with the adopted cluster reddening. Berkeley 44 is indeed an old open cluster, but inferences about its parameters derived using the larger reddening estimated by Carraro et al. (2006) differ from those inferred from 2MASS observations.

3.2. *Turner 1*

The sparse cluster designated as Turner 1 (Figure 5) surrounding the long-period Cepheid S Vul was discovered during the preparation of finder charts for Galactic Cepheids (Turner 1985b), and was subsequently studied on the basis of photoelectric and photographic *UBV* photometry by Turner, Leonard, & Madore (1986).

UBV photometry for stars in Turner 1 yielded a cluster distance of 643 ± 25 pc and a reddening of $E(B–V) = 0.48 \pm 0.02$ for what appeared to be an old group of G-type dwarfs with a putative red giant branch, although there was also evidence for more heavily reddened B-type stars in the same field (Turner et al. 1986). The limited *UBV* data implied that Turner 1 lay foreground to the Cepheid S Vul, which is projected near its center, although no further tests were made, spectroscopic observations being restricted by the faintness of cluster stars. It was noted, however, that the putative reddened G-dwarf sequence identified from *UBV* colors might be contaminated by more heavily reddened B dwarfs.

2MASS JHK_s data provide new insights into the earlier results. It is possible to detect a sparse group

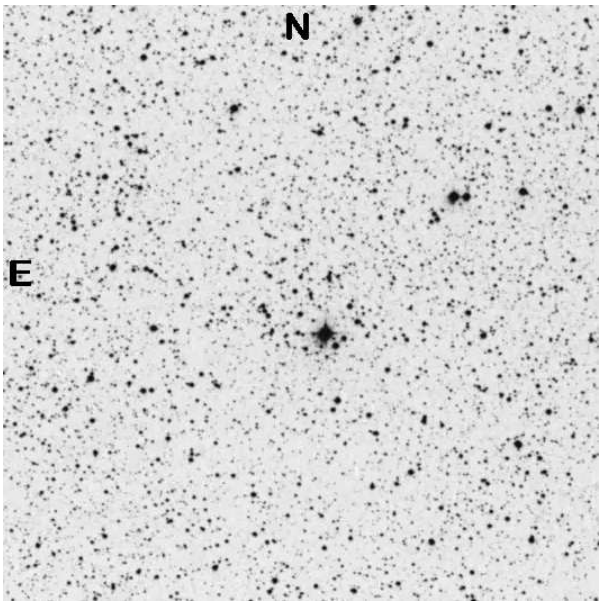

Fig. 5. The 15′ × 15′ field of Turner 1 from the Palomar Observatory Sky Survey red image of the field. The image is centered on 2000 co-ordinates: 19:48:26.5, +27:17:59, the cluster center identified from star counts (Turner 1985b). S Vul is the bright star near the center of the image.

of G dwarfs (with rather large photometric scatter) and a putative late-K giant branch in the data, with similar parameters to the *UBV* study (Figure 6). But many of the stars in the field, and most of the stars within 11′ of the adopted cluster center, appear instead to be reddened B-type and A-type stars (Figure 7). A best fit by eye to the JHK_s observations for the former yields a reddening of $E(J–H) = 0.15 \pm 0.02$ ($E(B–V) = 0.51 \pm 0.07$) and a distance modulus of $J\text{-}M_J = 9.7 \pm 0.1$ ($V_0\text{–}M_V = 9.34 \pm 0.24$), corresponding to a distance of $d = 0.74 \pm 0.08$ kpc, values that are reasonably consistent with those obtained for the cluster from *UBV* photometry. The model isochrone from Meynet et al. (1993) that best fits the observations has $\log t = 9.8$, implying a cluster age of ∼6 Gyr, although the red giants are displaced redward of that isochrone, much like in the case for Berkeley 44 red giant clump stars. Conceivably a refined empirical calibration of 2MASS intrinsic colors that includes a separate relation for red giant stars could eliminate the problem. There appear to be large numbers of M dwarfs lying along the line of sight to the cluster.

The implied best fit by eye to the JHK_s observations for the group of reddened B-type stars yields a reddening of $E(J\text{-}H) = 0.30 \pm 0.02$ ($E(B\text{-}$