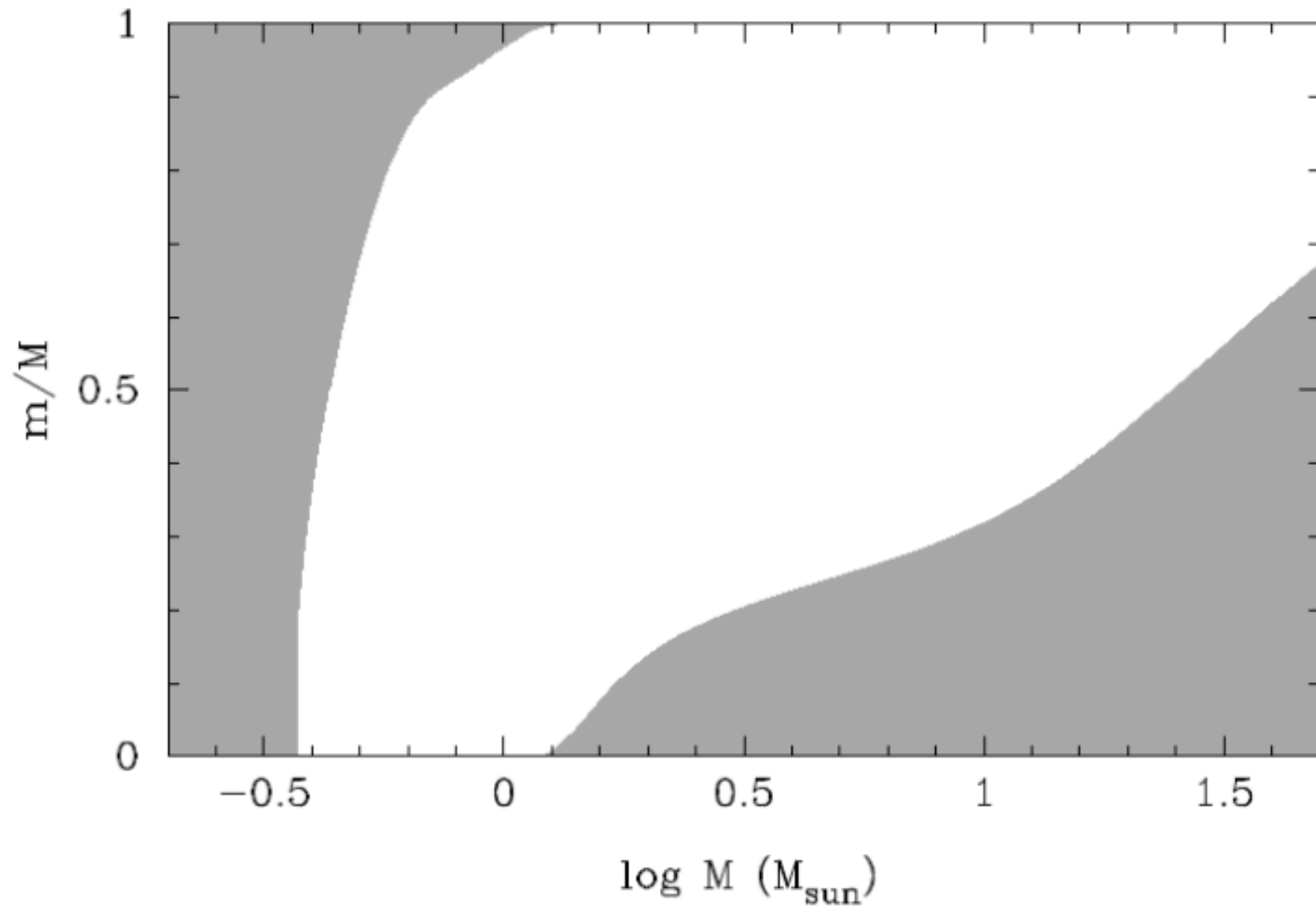
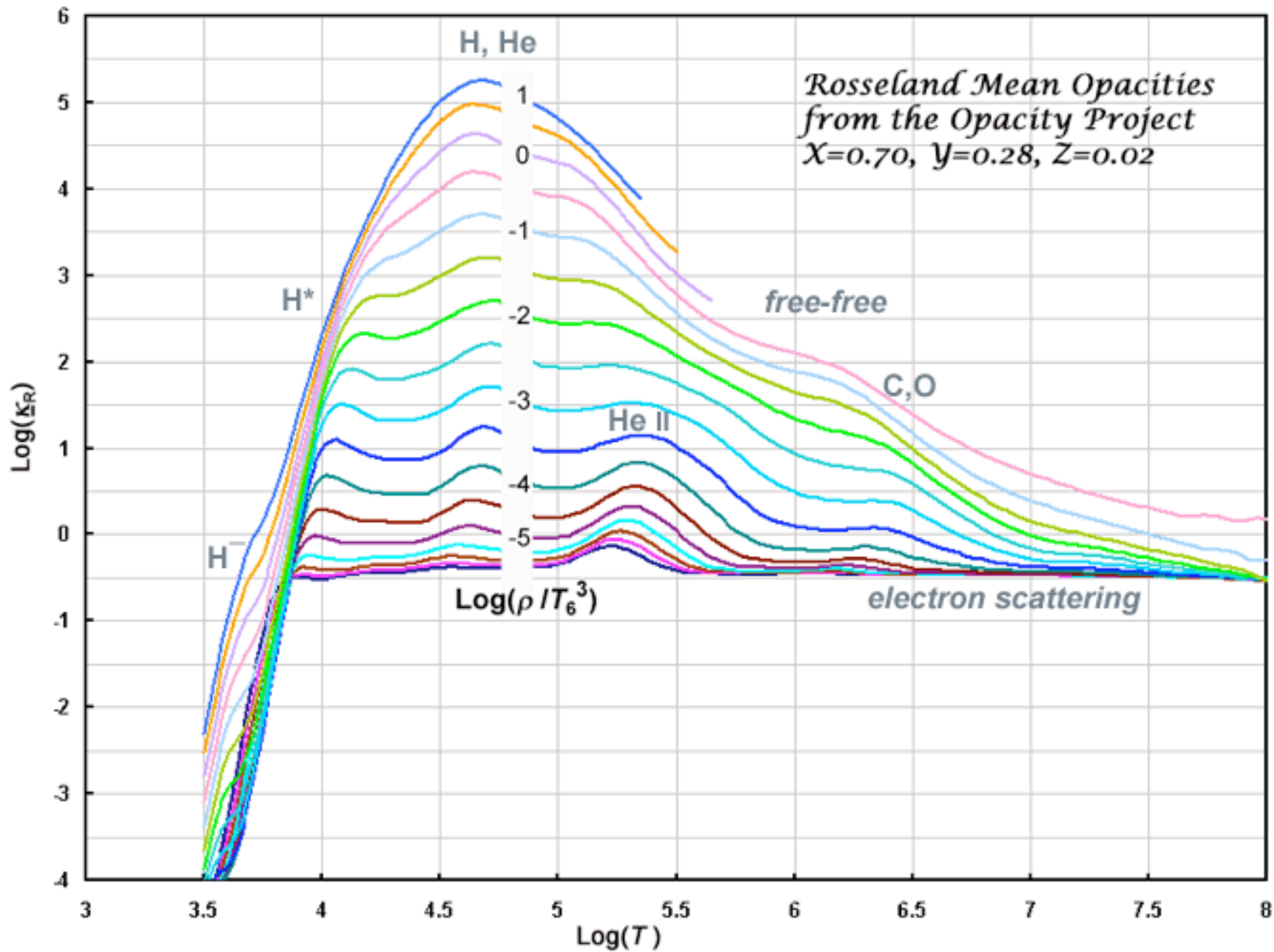


Shaded regions are convective, white regions are radiative





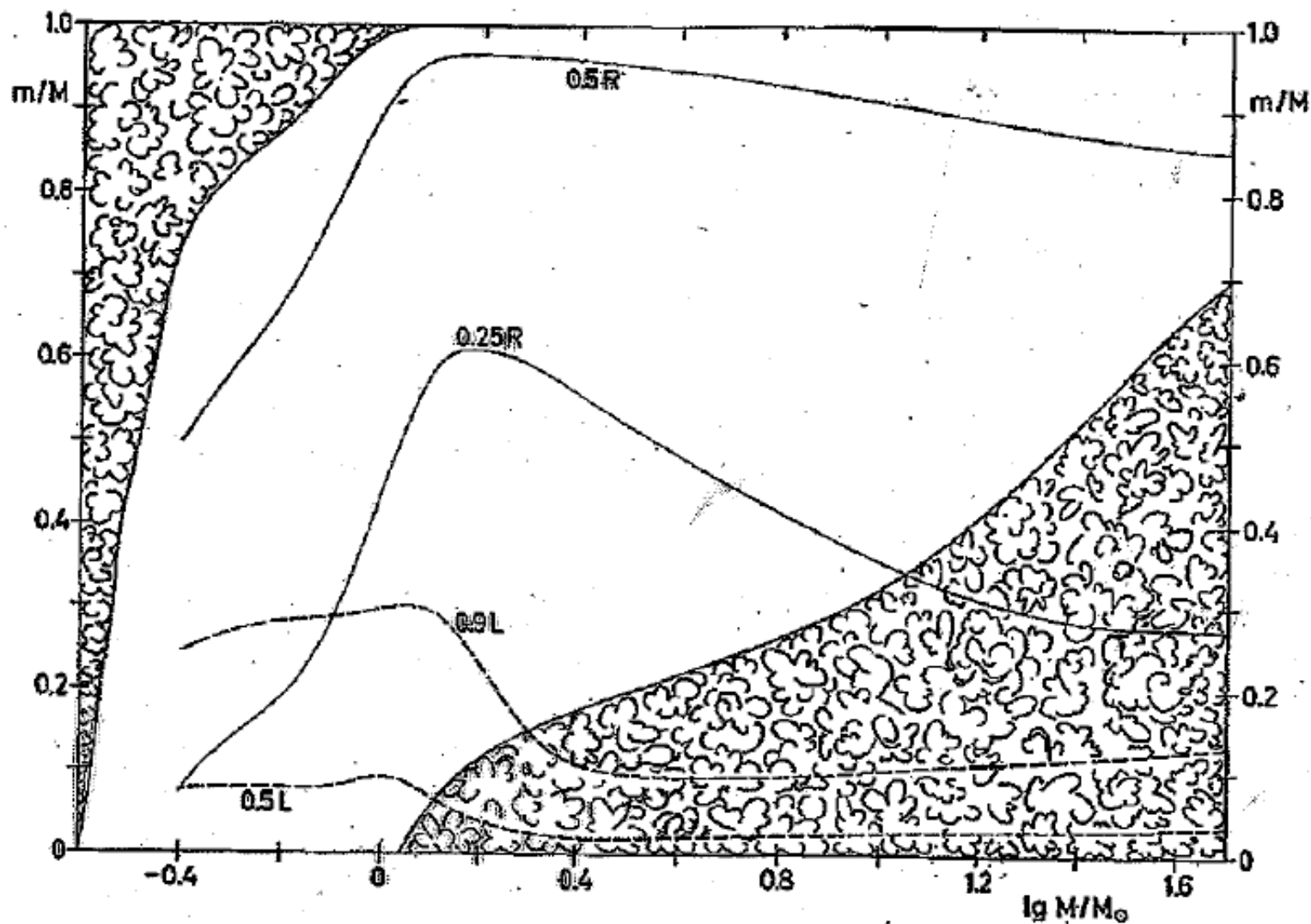


Fig. 22.7. The mass values m from centre to surface are plotted against the stellar mass M for the same zero-age main-sequence models as in Fig. 22.1. "Cloudy" areas indicate the extension of convective zones inside the models. Two solid lines give the m values at which r is $1/4$ and $1/2$ of the total radius R . The dashed lines show the mass elements inside which 50% and 90% of the total luminosity L are produced

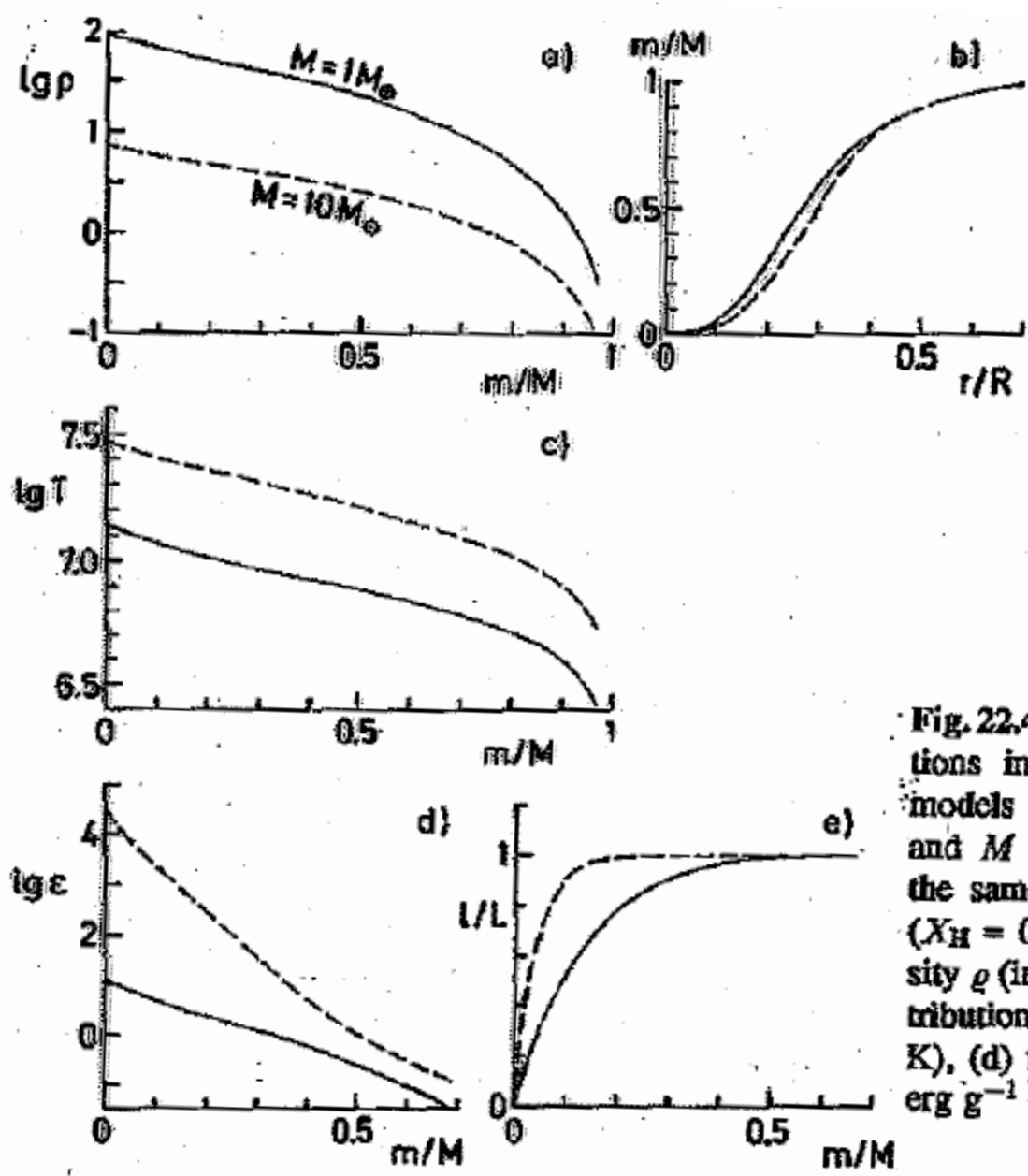
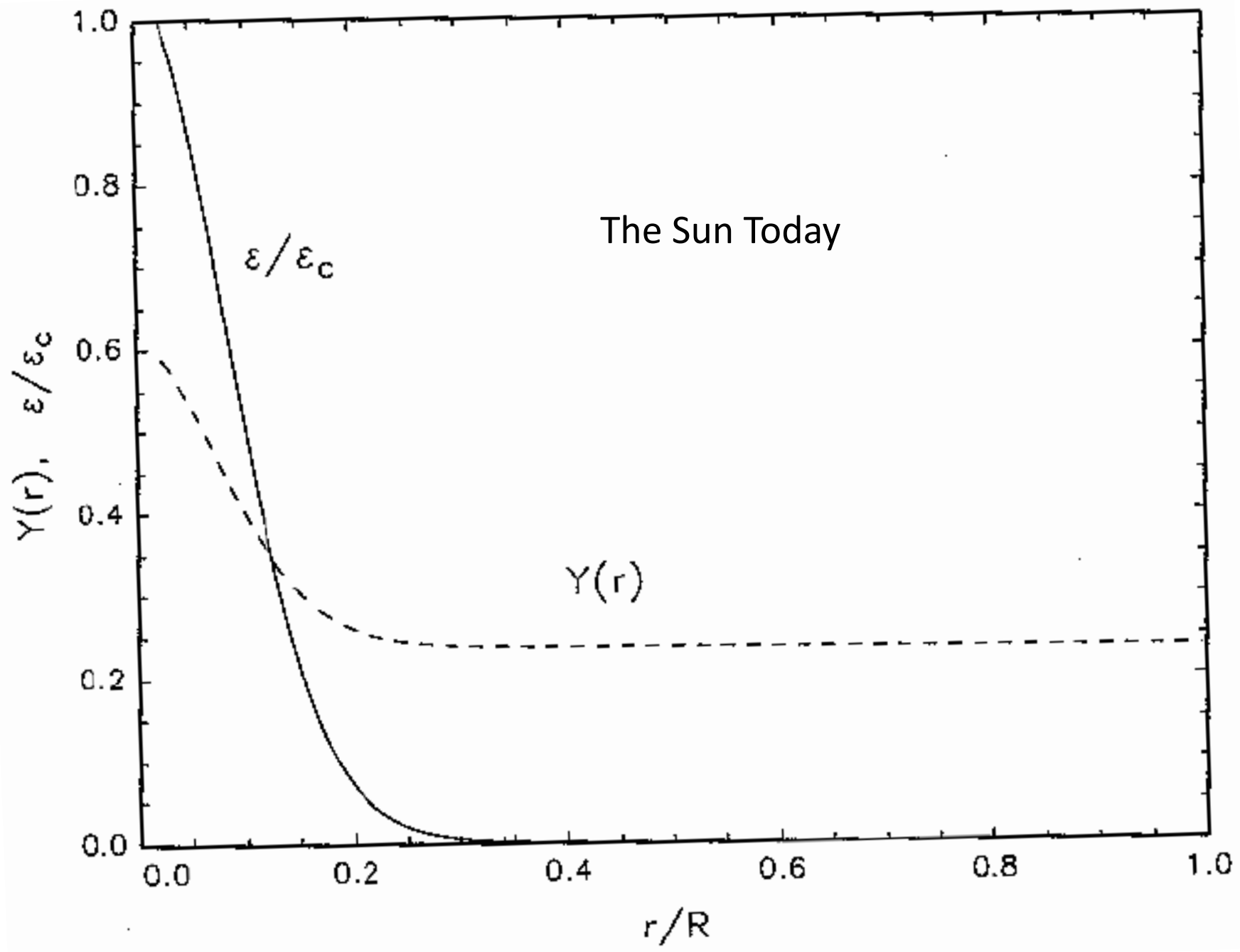


Fig. 22.4. a, b The run of some functions inside zero-age main-sequence models for $M = 1M_{\odot}$ (solid lines) and $M = 10M_{\odot}$ (dashed lines) with the same composition as in Fig. 22.1 ($X_{\text{H}} = 0.685$, $X_{\text{He}} = 0.294$); (a) density ρ (in g cm^{-3}), (b) radial mass distribution $m(r)$, (c) temperature T (in K), (d) nuclear energy production (in $\text{erg g}^{-1} \text{s}^{-1}$), (e) local luminosity l



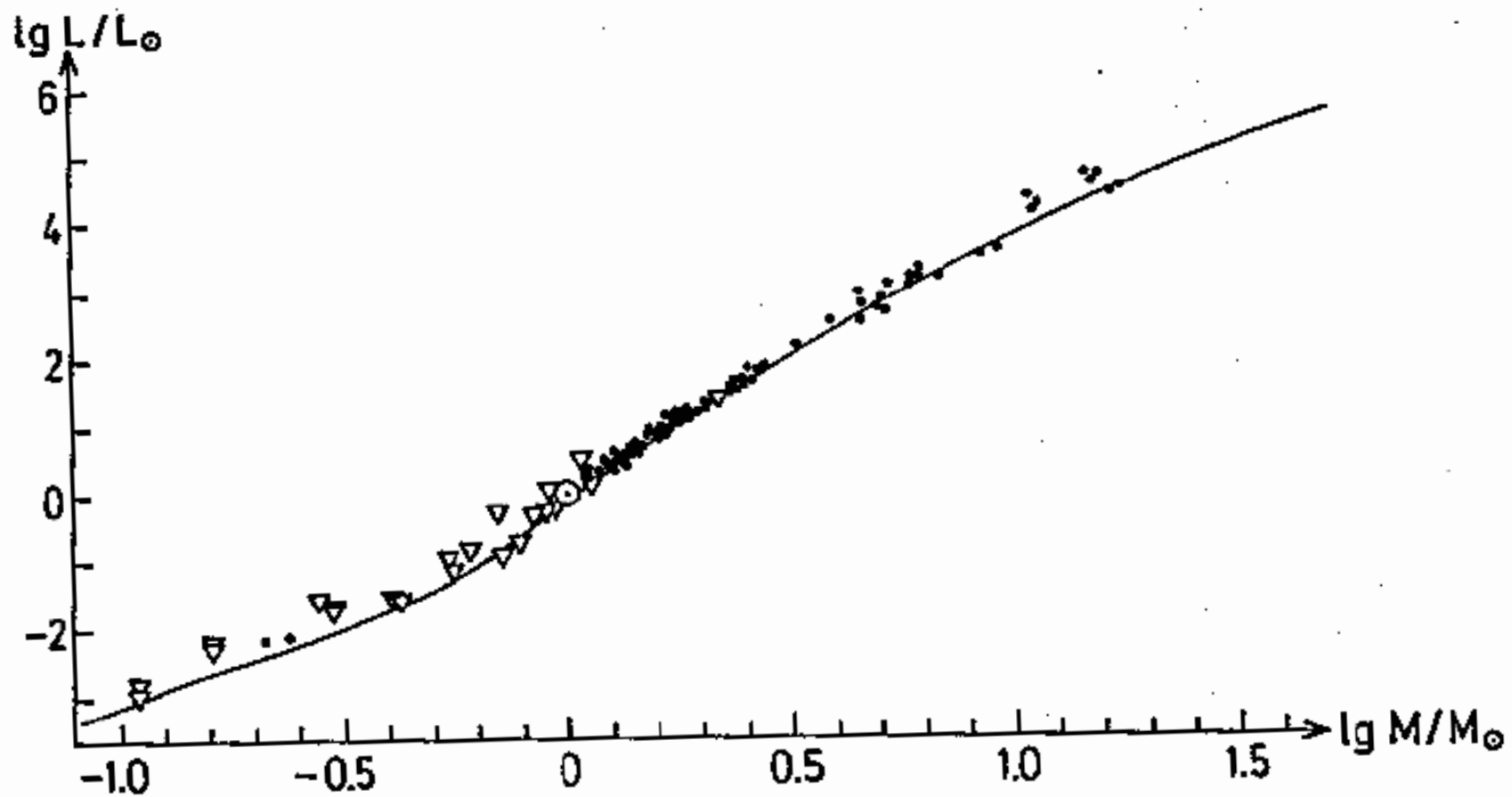


Fig. 22.3. The line gives the mass–luminosity relation for the models of the main sequence in Fig. 22.1. Measurements of binary systems are plotted for comparison (the symbols meaning as in Fig. 22.2)

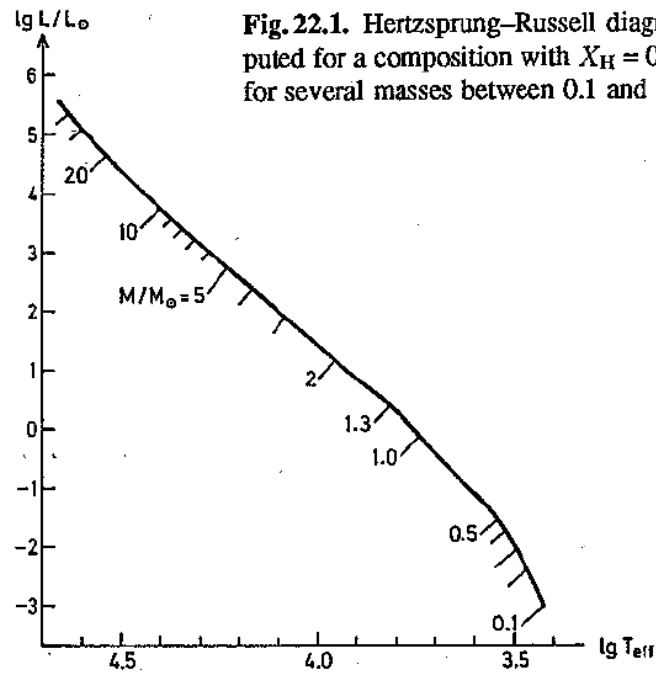


Fig. 22.1. Hertzsprung-Russell diagram with the zero-age main sequen-
 computed for a composition with $X_{\text{H}} = 0.685$, $X_{\text{He}} = 0.294$. The loca-
 for several masses between 0.1 and $22M_{\odot}$ are indicated below 1

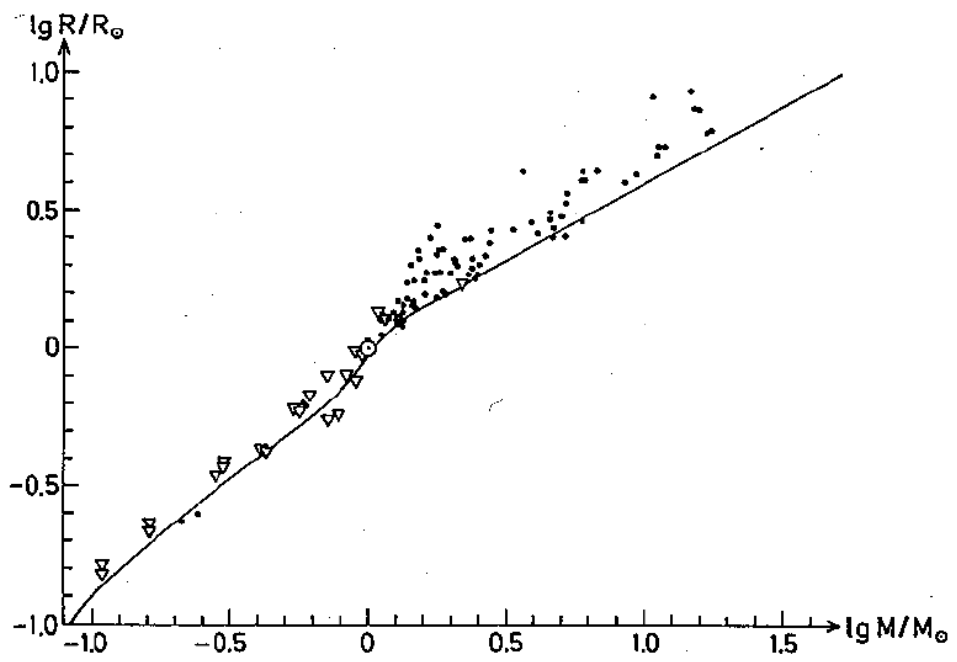


Table 9.1 Evolutionary lifetimes (years)

M/M_{\odot}	1-2	2-3	3-4	4-5
15	6.7(2)	2.6(4)	1.3(4)	6.0(3)
9	1.4(3)	7.8(4)	2.3(4)	1.8(4)
5	2.9(4)	2.8(5)	7.4(4)	6.8(4)
3	2.1(5)	1.0(6)	2.2(5)	2.8(5)
2.25	5.9(5)	2.2(6)	5.0(5)	6.7(5)
1.5	2.4(6)	6.3(6)	1.8(6)	3.0(6)
1.25	4.0(6)	1.0(7)	3.5(6)	1.0(7)
1.0	8.9(6)	1.6(7)	8.9(6)	1.6(7)
0.5	1.6(8)			

Note: powers of 10 are given in parentheses.

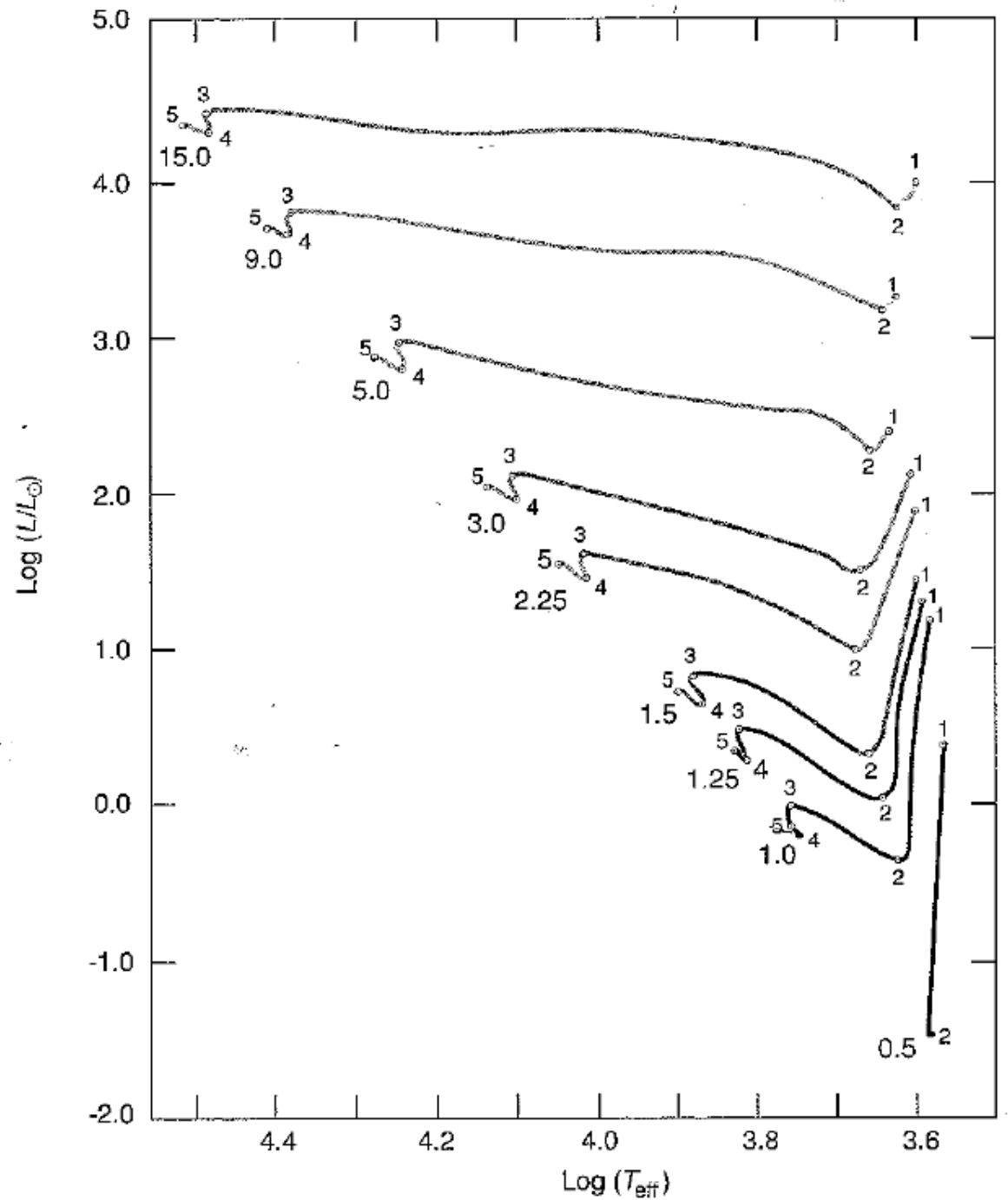


Table 9.2 Main-sequence lifetimes

<i>Mass</i> (M_{\odot})	<i>Time</i> (yr)	α
0.1	6×10^{12}	-2.8
0.5	7×10^{10}	-2.8
1.0	1×10^{10}	
1.25	4×10^9	-4.1
1.5	2×10^9	-4.0
3.0	2×10^8	-3.6
5.0	7×10^7	-3.1
9.0	2×10^7	-2.8
15	1×10^7	-2.6
25	6×10^6	-2.3

