69. Analyzing the forces tending to drag the $M = 5124$ kg stone down the oak beam, we find

$$F = Mg\left(\sin\theta + \mu_s \cos\theta\right)$$

where $\mu_s = 0.22$ (static friction is assumed to be at its maximum value) and the incline angle θ for the oak beam is $\sin^{-1}(3.9/10) = 23^\circ$ (but the incline angle for the spruce log is the complement of that). We note that the component of the weight of the workers (N of them) which is perpendicular to the spruce log is $Nmg\cos(90^\circ - \theta) = Nmg\sin\theta$, where $m = 85$ kg. The corresponding torque is therefore $Nmg\ell\sin\theta$ where $\ell = 4.5 - 0.7 = 3.8$ m (see figure). This must (at least) equal the magnitude of torque due to F, so with $r = 0.7$ m, we have

$$Mgr\left(\sin\theta + \mu_s\cos\theta\right) = Ngm\ell\sin\theta\ .$$

This expression yields $N \approx 17$ for the number of workers.