NOTE TO THE ARTICLE "TEMPERATURE DISTRIBUTION IN A LIQUID LAYER ON A HORIZONTAL SOLID SURFACE"

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In [1], dealing with the temperature distribution in a plane horizontal liquid layer of known mass, as the condition of absence of convection we took Schwarzschild's criterion [2] (using the notation of [1])

$$a > -g\,\delta t/c, \tag{1}$$

which is true, in general, if we consider compressibility and neglect dispersion [3].

A more justifiable criterion, in accordance with the conditions of the problem stated in [1], seems to be the Rayleigh criterion [2, 3]

$$\mathrm{Ra} \equiv -\frac{g\rho c\delta a h^4}{\lambda\nu} < N, \tag{2}$$

where ν is the kinematic viscosity of the liquid and N ≃ 1100.65 [4], from which follows the condition for stability of the liquid at rest, in the form

$$\frac{x^4}{y^3} > -N\frac{\nu}{g\rho c\delta\lambda^2}(\alpha_1\beta)^3. \tag{3}$$

For $\Delta t_e > 0$, i.e., $y > 0$, of course, stability will exist as before.

In the general problem of a real liquid, analogous use should be made of the general criterion of absence of convection [5], of which (1) and (2) are the corresponding limiting cases.

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