$$\Delta\Omega = -\frac{3}{10}\frac{M^2 G}{c}\ \epsilon_2\left[\frac{3\ E^2+1}{E}\cot^{-1}E - 3\right] \quad (9)$$

where M denotes the mass of the spheroid. The change in the gravitational potential energy of the spheroid is of the first order in ϵ only for a P_2 deformation and of higher order for all higher order deformations.

For a P_2 deformation of the spheroid, for which both Δm and $\Delta\Omega$ are of the order ϵ, the condition

$$\Delta\Omega + \Delta m = 0$$

for equilibrium gives that a configuration is stable for P_2 deformation if

$$H = H_{eq}\left[\frac{f(e)}{e^2 F_2(e)}\right]^{\frac{1}{2}} \quad (10)$$

where, for convenience, we have put

$$H_{eq} = \sqrt{\frac{3}{10}}\ \frac{M\sqrt{G}}{a^2}$$

a, being the major half-axis of the spheroid, and G the constant of gravitation.
Here the functions $f(e)$ and $F_2(e)$ are defined as

$$f(e) = \frac{3-2\ e^2}{e\ (1-e^2)^{\frac{3}{2}}}\cot^{-1}\left(\frac{1-e^2}{e^2}\right)^{\frac{1}{2}} - 3 \quad (11)$$
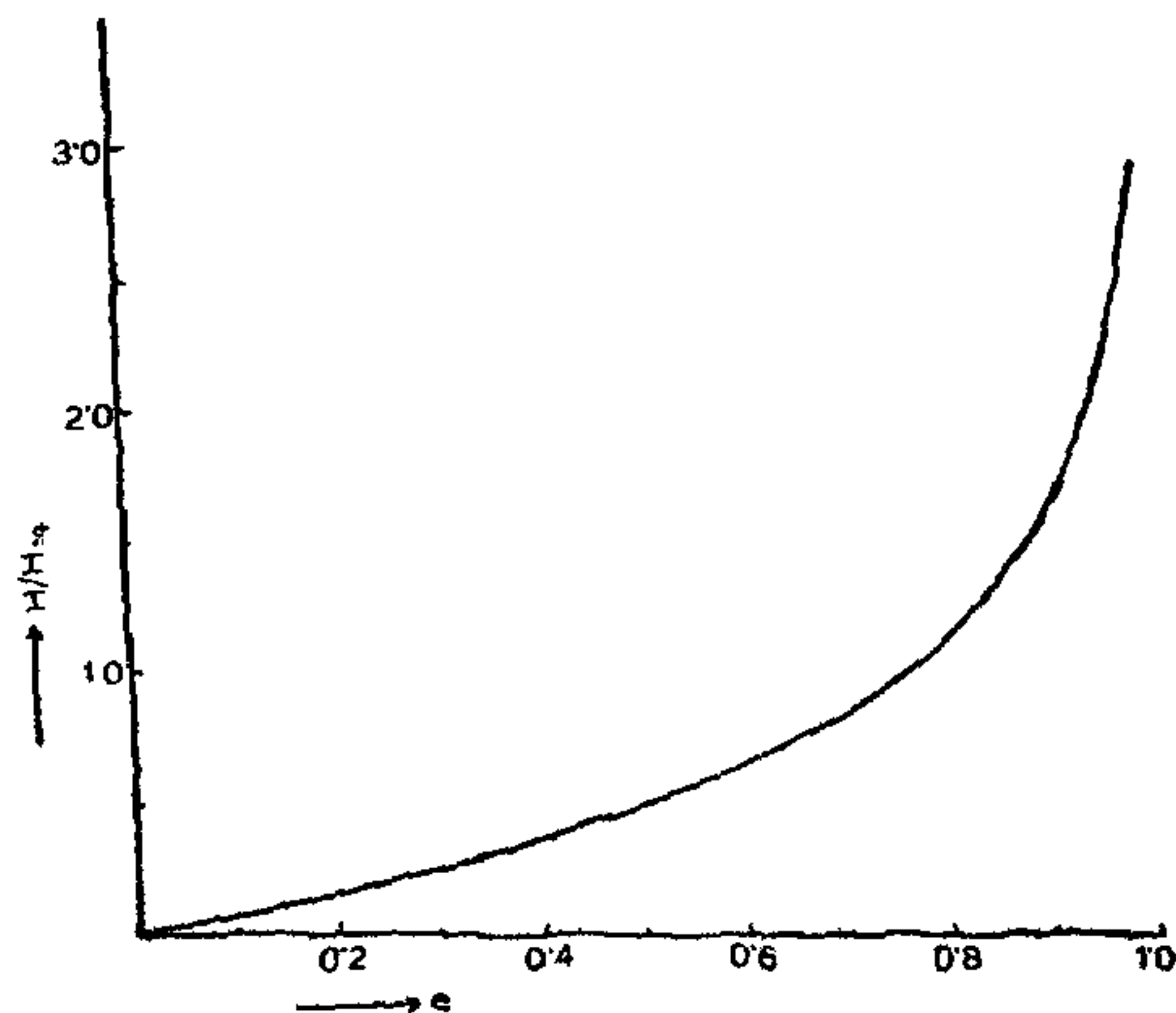
and

$$F_2(e) = \frac{e^2\left(1-\dfrac{k}{3}\right)}{3\ (1-e^2)^{\frac{1}{2}}Q_1'(iE)} - \frac{(1-k)\left(1+\dfrac{k}{3}\right)}{4\ [Q_1'(iE)]^2}\ f(e) \quad (12)$$

(e denotes the eccentricity of the spheroid).

The function H/H_{eq} is plotted against e for the case $k = 0$ in Fig. 1, and for the other two cases in Fig. 2. We find that H/H_{eq} increases with increase in the eccentricity for the three types of magnetic field discussed.
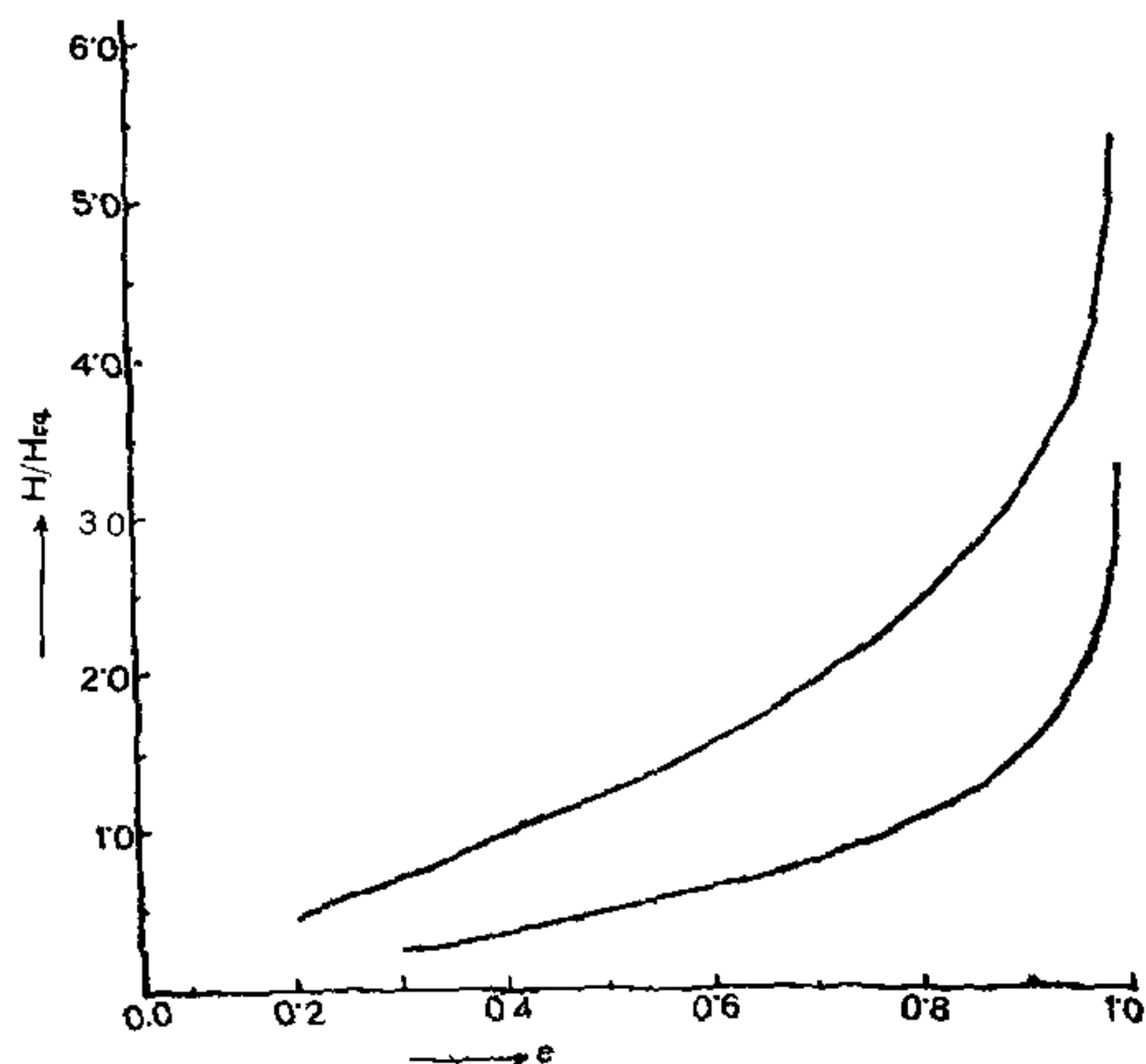

FIG. 2

However, H/H_{eq} required for stability of the spheroid is more for the case when $k\to\infty$, $H \to 0$ but kH remaining finite$(= H_0)$. Thus we find that there exists a unique configuration for a spheroid which is stable for a P_2 deformation for each of the three types of magnetic field under consideration.

The detailed paper shall be published elsewhere.

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1. Guro Gjellestad, *Astrophys. J.*, 1954, **119**, 14.

FIG. 1

LADY TATA SCIENTIFIC RESEARCH SCHOLARSHIPS, 1956-57

THE Trustees of the Lady Tata Memorial Trust are offering six scholarships of Rs. 250 each per month for the year 1956-57 commencing from 1st July 1956. Applicants must be of Indian nationality and Graduates in Medicine or Science of a recognised University. The scholarships are tenable in India only and the holders must undertake to work whole-time under the direction of a scientist of standing in a recognised research institute or laboratory on a subject of scientific investigation that must have a bearing either directly or indirectly on the alleviation of human suffering from disease. Applications must conform to the instructions drawn up by the Trust and should reach by March 15, 1956. Candidates can obtain these instructions and other information they desire from the Secretary, the Lady Tata Memorial Trust, Bombay House, Bruce Street, Fort, Bombay-1.