$$-\frac{\partial K}{\partial P(y)} = \ln P(y) + 1 + \beta c(y) + \gamma = 0\,. \tag{16}$$

From where it is obtained a solution in the view of an extremal distribution of the probabilities [65, chapter 3, § 3.3, p. 67, (3.3.5, 3.3.6)]:

$$P(y) = e^{-1-\gamma-\beta c(y)}, \tag{17}$$

$$P(y) = \frac{e^{-\beta c(y)}}{\sum_y e^{-\beta c(y)}}\,. \tag{18}$$

The expression of (17) is an analogous one to the obtained in work [4, p. 623, (2-4)].

A generalization of the Jaynes' principle is optimization problems with a functional of the following view [XLVIII, chapter 2, § 2.1, p. 16, (2.1.10)]:

$$\Phi_\pi = \int_{t_0}^{t_1} \left( -\sum_{i=1}^{N} \pi_i(t) \cdot \ln \pi_i(t) + \beta \cdot \sum_{i=1}^{N} \pi_i(t) \cdot F_i + \gamma \cdot \left[ \sum_{i=1}^{N} \pi_i(t) - 1 \right] \right) \cdot dt\,, \tag{A}$$

where $F_i$ – function relating with a certain alternative.

Designating the under-integral function of (A) as $R^*$, we get the necessary conditions of an extremum

$$\frac{\partial R^*}{\partial \pi_i} = 0\,, \quad \frac{\partial R^*}{\partial x} - \frac{d}{dt}\left( \frac{\partial R^*}{\partial \dot{x}} \right) = 0\,, \tag{B}$$

which is a modification of the known equations by Euler-Lagrange for a case of the simplest (main) variational problem.

Generalizations for cases of movable boundaries, broken trajectories, and trajectories with corners, analogues to the Neter theorem, equation by Hamilton-Jacoby and others, as that was supposed and envisaged [XXXII], are already published in a separate work [XXX] dedicated, as a whole, to the modified Euler-Lagrange variational principle.

Let us notice that the integral of the first sum member of the under-integral function of (A) can be interpreted as an index of an average (mean) uncertainty at the fragment of the integration [XXX, chapter 2, § 2.1, p. 14, 15, (2.1.2)].