NOTE ON A PROPOSITION OF PARETO[1]

As it is pointed out by himself, in a footnote,[2] Pareto's theory of value has developed from his first to his last writings. Starting in his *Cours* with the concept of ophelimity — which is another name for the already used concept of utility — he proceeds to the theory of choice and of indifference directions, as we find it in the *Manuel* and in a modified form in the article in the *Encyclopédie.* Reading the successive writings of Pareto, one gets the impression that he was seeking a theory of exchange which does not need any supplementary concept. This is especially conspicuous in the article here discussed, which contains one of his last statements on the matter.

Following his tendency to avoid any *a priori* idea as to what the individual's behavior will be in a market, Pareto tried to obtain the exchange equations from a much simpler assumption, which follows at once from everyday facts:

Any individual possessing the quantities $x_0, y_0, z_0, \cdots t_0$ of n commodities $X, Y, Z, \cdots T$, faced with a certain price system, or rather with given ratios of exchange $p_y, p_z, \cdots p_t$, will find a uniquely determined position $x^0, y^0, z^0, \cdots t^0$, where he will remain indefinitely if the circumstances do not change.[3] Pareto translates this assumption, which we must agree seems more direct than those underlying the concept of ophelimity or of those involved in the theory of choice, into a mathematical form by writing down the system:[4]

$$
(4)\quad
\begin{aligned}
&f^{(1)}(x^0, y^0, \cdots t^0, p_y, p_z, \cdots p_t, x_0, y_0, \cdots t_0) = 0\\
&f^{(2)}(x^0, y^0, \cdots t^0, p_y, p_z, \cdots p_t, x_0, y_0, \cdots t_0) = 0\\
&\cdot \quad \cdot \quad \cdot \quad \cdot \quad \cdot \quad \cdot \quad \cdot \quad \cdot \quad \cdot \quad \cdot \quad \cdot \quad \cdot \quad \cdot \quad \cdot\\
&f^{(n)}(x^0, y^0, \cdots t^0, p_y, p_z, \cdots p_t, x_0, y_0, \cdots t_0) = 0
\end{aligned}
$$

1. Encyclopédie des Sciences Mathématiques, Tome I, vol. 4, fascicule 4.
2. Op. cit., p. 596.
3. Op. cit., pp. 592, 594.
4. The coördinates of the equilibrium point are indicated in the present note by $x^\circ, y^\circ, z^\circ, \ldots t^\circ$, for I wish to keep the notations without