of ω_u^2 is seen to be

$$H_{x_ux_u}X^2 + 2H_{x_uy_u}XY + H_{y_uy_u}Y^2 + 2H_{x_uz_u}XZ + 2H_{y_uz_u}YZ + H_{z_uz_u}Z^2.$$

Equations (12), with F replaced by H, reduce this to the form

$$H_{11}(X^2 + Y^2 + Z^2)^2 = H_{11}.$$

Similarly the coefficients of $\omega_u\omega_v$ and ω_v^2 can be proved equal to $2H_{12}$ and H_{22} respectively. The other coefficients will be called H_{00}, $2H_{01}$ and $2H_{02}$ respectively, and equation (11) becomes

$$\delta^2 J = \epsilon^2 \int\int_\Omega (H_{00}\omega^2 + 2H_{01}\omega\omega_u + 2H_{02}\omega\omega_v + H_{11}\omega_u^2 + 2H_{12}\omega_u\omega_v + H_{22}\omega_v^2)dudv.$$

This equation is in the same form as equation (5), and from this point on the argument is so nearly the same as in the non-parametric case that it need not be repeated here. The analogue of inequality (10) is seen to be

$$H_{11}(x, y, z, x_u, \cdots, z_v; \lambda)H_{22}(x, y, z, x_u, \cdots, z_v; \lambda) - H_{12}^2(x, y, z, x_u, \cdots, z_v; \lambda) \geqq 0.$$

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NOTE ON THE DERIVATIVE AND THE VARIATION OF A FUNCTION DEPENDING ON ALL THE VALUES OF ANOTHER FUNCTION.

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1. IN a recent article,* Fréchet has given a treatment of the differential of a function depending on a curve, by making use of and evaluating Riesz's expression of a linear relation in terms of a Stieltjes integral. According to Fréchet, if $\overset{b}{\underset{a}{F}}[\varphi]$ depends on all the values of $\varphi(x)$ between a and b, then

* M. Fréchet, "Sur la notion de différentielle d'une fonction de ligne," *Transactions of the American Mathematical Society*, vol. 15 (1914), pp. 135–161.