A Correction to "Extended Compatibility Conditions for the Study of Surfaces of Discontinuity in Continuum Mechanics"

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A trivial error in writing a subscript in equations (45) in the paper on *Extended compatibility conditions for the study of surfaces of discontinuity in continuum mechanics* in THIS JOURNAL [6(1957) pp. 311-322] has resulted in an error in one of the kinematical conditions of compatibility of the second order. The correct equations (45) are

$$(45) \quad \frac{\delta[Z_{,i}]}{\delta t} = [Z_{,ij}]G\nu_j + \left[\frac{\partial^2 Z}{\partial x_i \partial t} \right].$$

In place of our previous equations (46) we now have

$$(46) \quad A'_{,\alpha} = \frac{\delta}{\delta t} ([Z_{,i}]x_{i,\alpha}) - [Z_{,i}] \frac{\delta x_{i,\alpha}}{\delta t} - [Z_{,ij}]Gx_{i,\alpha}\nu_j.$$

When the proper substitutions are made in these relations we obtain

$$(47) \quad A'_{,\alpha} = \frac{\delta A_{,\alpha}}{\delta t} - [Z_{,i}] \frac{\delta x_{i,\alpha}}{\delta t} - GB_{,\alpha},$$

in place of the previous equations (47). Hence equations (49) and (51) should be replaced by the following equations

$$(49) \quad A'_{,\alpha} = \left(\frac{\partial^2 A}{\partial u^\alpha \partial u^\beta} - [Z_{,i}] \frac{\partial^2 x_i}{\partial u^\alpha \partial u^\beta} \right) \frac{\delta u^\beta}{\delta t} + \frac{\partial^2 A}{\partial u^\alpha \partial t} - [Z_{,i}] \frac{\partial^2 x_i}{\partial u^\alpha \partial t} - GB_{,\alpha},$$

$$(51) \quad A'_{,\alpha} = (A_{,\alpha\beta} - Bb_{\alpha\beta}) \frac{\delta u^\beta}{\delta t} + \frac{\partial^2 A}{\partial u^\alpha \partial t} - [Z_{,i}] \frac{\partial^2 x_i}{\partial u^\alpha \partial t} - GB_{,\alpha}.$$

As a consequence of the above relations (51) the previous equations (61), giving the final form of these kinematical conditions of compatibility of the

second order, and the equations (63) should be modified to read

$$(61) \quad \left[\frac{\partial^2 Z}{\partial x_i \partial t} \right] = \left(-CG + \frac{\delta B}{\delta t} + g^{\alpha\beta} G_{,\alpha} A_{,\beta} \right) v_i - g^{\alpha\beta} g^{\sigma\tau} A_{,\alpha\sigma} x_{i,\beta} x_{k,\tau} \frac{\partial x_k}{\partial t} \\ - g^{\alpha\beta} (GB)_{,\alpha} x_{i,\beta} + g^{\alpha\beta} x_{i,\beta} \left(\frac{\partial^2 A}{\partial u^\alpha \partial t} - g^{\sigma\tau} A_{,\sigma} x_{k,\tau} \frac{\partial^2 x_k}{\partial u^\alpha \partial t} \right),$$

and

$$(63) \quad \left[\frac{\partial^2 Z}{\partial x_i \partial t} \right] x_{i,\alpha} = -g^{\sigma\tau} A_{,\alpha\sigma} x_{k,\tau} \frac{\partial x_k}{\partial t} - (BG)_{,\alpha} + \frac{\partial^2 A}{\partial u^\alpha \partial t} - g^{\sigma\tau} A_{,\sigma} x_{k,\tau} \frac{\partial^2 x_k}{\partial u^\alpha \partial t}.$$

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