Equations (5.20) and (5.25) are incorrect and should read as shown below. First, note that the summation convention involving indices in coefficients $c_1^{(j)}$, $c_2^{(k)}$ and $c_3$ is somewhat different from the usual one and should be carefully handled. Thus, in equation (5.20), corresponding to the first equation, the second equation should read

$$\rho \ddot{u}_i = \mu \frac{1}{c_1^{(j)}} \left( \frac{u_{i,j}}{c_1^{(j)}} \right) + (\lambda + \mu) \frac{1}{c_1^{(i)}} \left( \frac{u_{j,i}}{c_1^{(j)}} \right).$$

(5.20)

Although $c_1^{(j)}$ is a function of $x_j$ only, and independent of $x_i$ ($i \neq j$), the term $u_{j,i}/c_1^{(j)}$ subject to summation over $j = 1, 2, 3$ and equals $u_{1,1}/c_1^{(1)} + u_{2,2}/c_1^{(2)} + u_{3,3}/c_1^{(3)}$. Therefore, it is incorrect to pull $c_1^{(j)}$ out from the derivative. Similarly, in equation (5.23) the expression $(c_3 u_{j,i}/c_1^{(i)} c_1^{(j)})_{,i}$ involves a summation over $j = 1, 2, 3$ so that, effectively, equation (5.25) should be disregarded and we obtain the same result as in equation (5.20).

To recapitulate, the coefficients $c_1^{(i)}$, $c_1^{(j)}$, $c_1^{(k)}$ and $c_2^{(i)}$, $c_2^{(j)}$, $c_2^{(k)}$ are not involved in the summation convention. For example, equation (3.2) is written explicitly as

$$\int_{S_d} \bar{f} \cdot \hat{n} dS_d = \int_{S_2} f_k c_2^{(k)} n_k dS_2 = \sum_{k=1}^{3} \int_{S_2} f_k c_2^{(k)} n_k dS_2$$

(3.2)

owing to the repeated index in $f_k$ and $n_k$. Also note that equation (3.5) does not involve a summation on $k$, although $c_1^{(k)}$ and $x_k$ have a repeated index '$k' 

$$\nabla_k^D := \frac{1}{c_1^{(k)}} \frac{\partial}{\partial x_k} (\cdot) \neq \sum_{k=1}^{3} \frac{1}{c_1^{(k)}} \frac{\partial}{\partial x_k} (\cdot).$$

(3.5)