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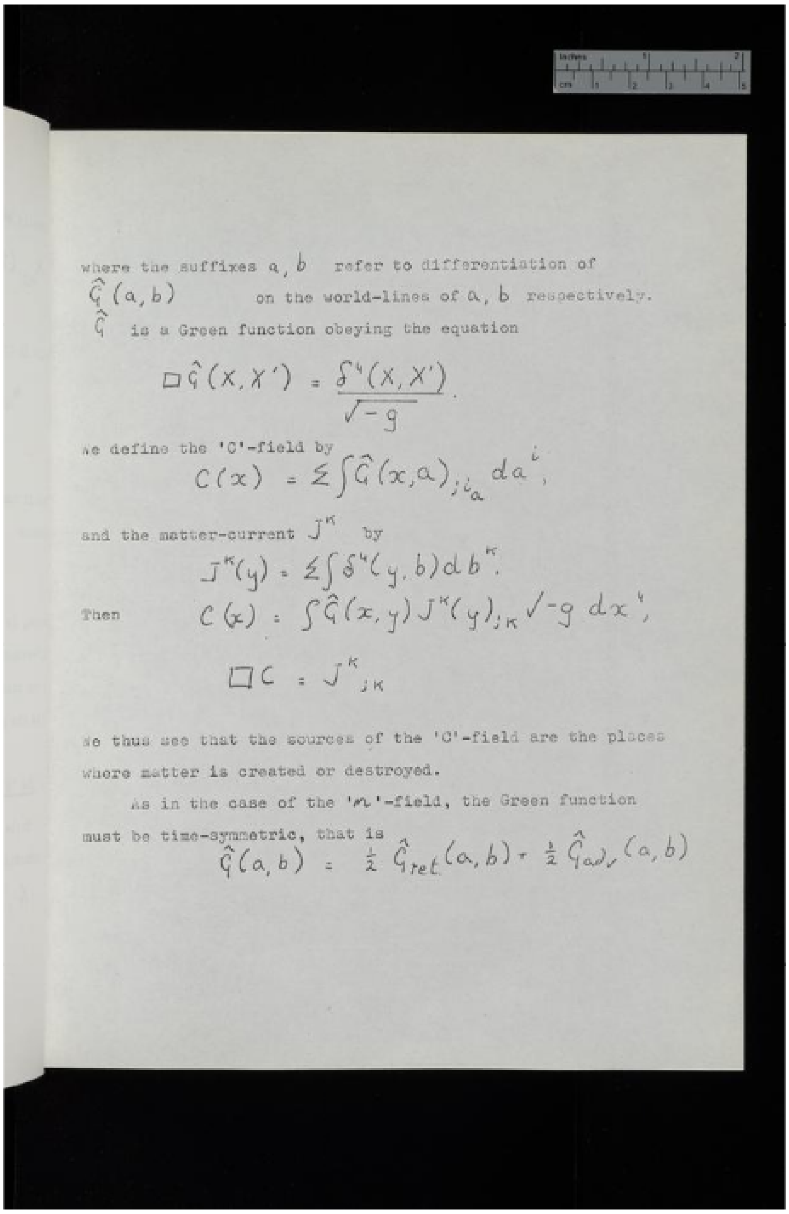

where the suffixes a, b refer to differentiation of $\hat{G}(a,b)$ on the world-lines of a, b respectively. $\hat{G}$ is a Green function obeying the equation

$$\Box \hat{G}(X, X') = \frac{\delta^4(X, X')}{\sqrt{-g}}.$$

We define the 'C'-field by

$$C(x) = \Sigma \int \hat{G}(x,a)_{;i_a} \, da^i ,$$

and the matter-current J^k by

$$J^k(y) = \Sigma \int \delta^4(y, b) \, db^k .$$

Then
$$C(x) = \int \hat{G}(x,y) J^k(y)_{;k} \sqrt{-g} \, dx^4 ,$$

$$\Box C = J^k{}_{;k}$$

We thus see that the sources of the 'C'-field are the places where matter is created or destroyed.

As in the case of the 'm'-field, the Green function must be time-symmetric, that is

$$\hat{G}(a,b) = \tfrac{1}{2} \hat{G}_{ret}(a,b) + \tfrac{1}{2} \hat{G}_{adv}(a,b)$$

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