We may then sum up roughly by saying that when positrons pass through matter, the number of slow secondary and ionization electrons produced will be the same as on the usual theory, whereas the number of fast secondary electrons ejected will be considerably changed. The number of fast secondaries is considerably increased for high energies of the positron. It should be possible to observe the difference experimentally.

SUMMARY

The ordinary collision of an electron with a positron, and the consequent scattering is considered on the Dirac theory of the positron. It is shown that exchange may take place between the electron we initially observe, and one of the virtual electrons in states of negative energy, and that this exchange very considerably modifies the scattering. It is further shown that an alternative way of looking at this exchange is to consider the process as one in which the initial electron and positron have been annihilated, giving rise simultaneously to a new pair. The ordinary scattering must then be modified on any theory in which the electron and positron can be created and annihilated in pairs.

The practical result of the extra scattering is that when positrons pass through matter, the number of slow secondary and ionization electrons produced is not changed, but the number of fast secondary electrons is considerably increased for high initial energies of the positron.