where $P = p^k p_k$, and the auxiliary condition $\frac{\partial}{\partial x_\mu} = 0$ is imposed. It can be shown for the pure radiation field that the factor $e^{-(P+P')/2b^2}$ does not lead to any consequences different from those of the orthodox theory; but if the electron is considered in the usual way to be a point singularity in the radiation field, so that the equation of the field of a moving electron is

$$e^{-a^2\Box} \Box A_k = \frac{ev_k}{c} \delta\{x - x_e(t)\}, \ v_k = \left(\frac{dx_e}{dt}, c\right), \quad (2)$$

the solution is finite everywhere, reducing to the usual solution at large distance, and to the difference between the retarded and advanced potentials introduced by Dirac[6] in the first approximation at small distance from the singularity. The energy and momentum of the field are also finite, and are identified with the energy and momentum of the electron. In this way the idea of Abraham[7] has been realized without the relativistic difficulties associated with a rigid electronic structure.

Before quantization, a Hamiltonian formulation is required, for which, because of the appearance of high derivatives in the Lagrangian, either the well-known method of Lagrangian multipliers or a method of successive approximation may be used. The interaction energy then has the form:

$$H_i = e\,\alpha\,.\,\Sigma e^{-\{k^2-(k\,.\,p)^2/E^2\}/2b^2}\, B(k) e^{ik\,.\,x/\hbar} + B^*(k) e^{-ik\,.\,x/\hbar}\, e^{-\{k^2-(k\,.\,p)^2/E^2\}/2b^2}, \quad (3)$$

where $E = (p^2 + mc^2)^{1/2} c$ is the energy of the electron with momentum p. The order of the factors is essential to the convergence of the electromagnetic self-energy, and is decided by the usual requirement that the emission operator $B(k)$ is written last and the absorption operator $B^*(k)$ first in proceeding to the quantum theory. This ensures that the contribution of all roundabout transitions to the self-energies and cross-sections are small and finite, while leaving the real processes unaffected except to a small and rather interesting degree, which, it may be hoped, improvement in experimental technique will confirm.

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Calculation of Factorial Moments of Certain Probability Distributions

I HAVE *recently[1] been investigating* certain probability distributions arising from points possessing one of k colours or characters arranged on a line or in the form of a rectangular lattice. In the course of these investigations it has been possible to establish the undermentioned theorem, which has proved to be very useful in evaluating the factorial moments of many probability distributions of a discrete nature.

Theorem. The rth factorial moment about zero for the probability distribution of some specified discrete character (or characters) is $r\,!$ multiplied by the expected number for r of the specified character (or characters).

The binomial and the hypergeometric distributions are the simplest cases where this theorem can be applied direct. For these distributions, the rth factorial moments, $\mu'_{[r]}$, are

$$r\,!\binom{n}{r} p^r = n^{(r)} p^r \text{ and}$$

$$\frac{r\,!\binom{n}{r}(Np)^{(r)}}{N^{(r)}} = \frac{n^{(r)}(Np)^{(r)}}{N^{(r)}},$$

respectively. They are evidently $r\,!$ times the expectation for r of the events.

Some of the other distributions which can be applied in this theorem are: (*a*) the theory of the distribution of black–black, black–white and other joins arising from points possessing any one of k colours arranged on a line or in the form of a rectangular lattice; (*b*) the distribution for the number of runs in ascending or descending order discussed by Kermack and McKendrick[2], which ultimately is the same thing as the distribution of peaks and troughs discussed by Kendall[3]; and (*c*) the distributions arising in the matching theory dealt with by Batin[4], Anderson[5] and Wilks[6]. It is also felt that the theorem will be useful in evaluating the factorial moments of many other distributions. The application and the proof of this theorem will be discussed in detail elsewhere shortly.

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The Word 'International'

IT has unfortunately become a too common habit to prefix the word 'international' to the title of institutions which have no claim to be so described. A recent instance is the announcement of an 'International' Congress of Mediterranean Prehistory and Protohistory, to be held in Florence in the spring of 1950. Its title is evidently modelled on that of the International Congress of Prehistoric and Protohistoric Sciences, a fully organised international society which met in London in 1934, and at Oslo in 1938, and is now arranging its third meeting, also for 1950. But the Italian 'Promoting Committee' consists only of seven Italian professors, and though it is patronized by the Italian Ministry of Education and the Foreign Office, it is 'sponsored' only by Italian institutes—at Rome, Florence and Bordighera. The circular announces that other Italian and foreign institutions will be named later on. But this is not good enough. It is time that some protest was made against the misuse of so significant a word as 'international' by bodies which have no claim to it.

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