used in the vaporization and reflectivity studies have not been able to modify with certainty the surface structure of the metal. The indications are that in extremely high vacuums certain changes in the vaporization rate and in the reflectivity of a metal should be produced by the application of sufficiently high electrostatic fields to the metal surface. In the case of reflectivity, in order to observe such effects, an improved form of apparatus would probably be required.

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Letters to the Editor

PROMPT publication of brief reports of important discoveries in physics may be secured by addressing them to this department. The closing date for this department is the third of the month. Because of the late closing date for the section no proof can be shown to authors. The Board of Editors does not hold itself responsible for the opinions expressed by the correspondents. Communications should not in general exceed 600 words in length.

Note on Events Distributed According to Chance

ARTHUR E. RUARK
University of North Carolina, Chapel Hill, North Carolina
April 17, 1944

IN a recent paper[1] I have shown how to calculate the chance W_n that n events will occur in a domain of several dimensions described by variables x, y, etc. W_n can always be found if we are given the chance $f(x, y)dxdy$ that an event will occur in $dxdy$. In this note, I wish to record a development which arose in a problem dealing with surface flaws and volume flaws in glass and other brittle materials. It turns out that the method can easily be extended to give us the chance W_n that n flaws will be found in the volume V and on the surface S of a specimen. Let f be the volume density of interior flaws and f' the surface density of flaws on the boundary (which may be of the same kind, or of a different kind). Then, if f and f' are *constant*, we find, putting $fV+f'S=b$, that $W_n=b^ne^{-b}/n!$ This Poisson formula will be obvious to those who happen to be familiar with the result of superimposing random distributions, dependent on a single variable, but perhaps not so obvious to the majority of physicists interested in the faults of brittle materials. For more general cases, where f and f' are not constant, differential equations analogous to those in the above-mentioned paper have been set up. The methods of integrating them are in general the same as in the previous paper.

I take this opportunity to correct an error in the above-mentioned paper; a minus sign is needed in the second line below Eq. (10).

[1] A. E. Ruark, Phys. Rev. **65**, 88 (1944).

The Decomposition of Water by the So-Called Permanent Magnet and the Measurement of the Intensity of the Magnetic Current

FELIX EHRENHAFT
New York, New York
April 28, 1944

THE magnetic current manifests itself in many phenomena. The polar movement[1] of bodies in an homogeneous magnetic field, reversing their direction of movement with the reversal of the field, showing that they bear an excess of north or south magnetic charge, constitutes a magnetic current. Thus the Peregrinus experiment becomes positive when performed with sensitive means. The well-known breaking experiment quoted by Maxwell[2] that a magnet when broken *ad infinitum* invariably gives always two separate magnets with equal poles cannot be found in the scientific literature, and it cannot be performed. This idealistic experiment does not prove that there is no true magnetism, north or south, because each breaking creates constriction, and from each constriction there is produced magnetism.

The decomposition of water into oxygen and hydrogen by the electromagnet[3] and the circulation of positively or negatively charged bodies and bubbles in the same plane, and at the same time, in directions opposite to one another, in the constant homogeneous vertical magnetic field, reversing their direction of circulation with the reversal of the field,[4] proves the existence of the magnetic current by the same criteria from which the existence of the electric current was deduced.