with the tube shown, it breaks away from the influence of the force which has been holding it, sweeps swiftly down the lower part of the cone, carrying away the ascending globules, and falls from its apex. Immediately afterwards a similar series of globules begins to ascend and another drop is formed and falls away like its predecessor, and so on continuously. The weights of the drops and the rate at which they are formed vary with the angle of the tube, the magnitude of its aperture, the form of the cone, the magnitude of the head, and so on. With the tube shown in (1) a drop weighing 0·0113 gm. was formed every 2 m. 20 sec. for 12 consecutive hours in one trial. (2) was photographed instantaneously while the globules were in the act of ascending the stem.

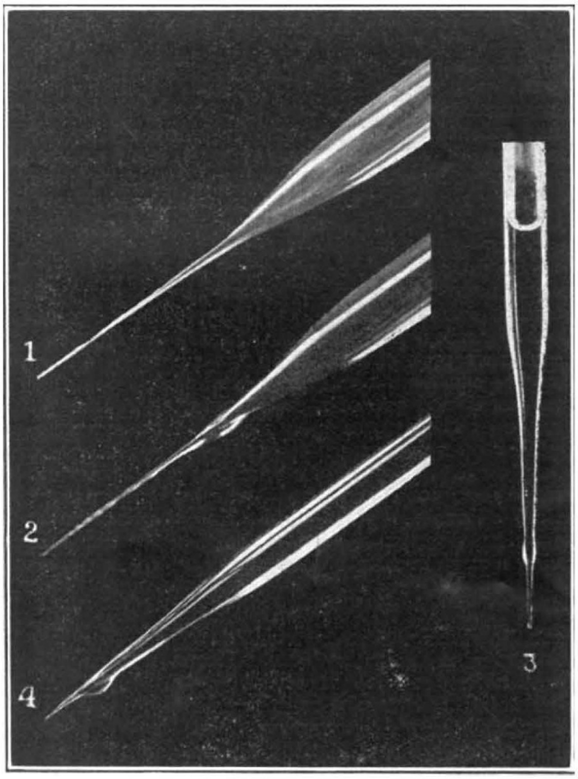

FIG. 1.—Scale, full size.

With some tubes, and some heads, the globules run up the wet surface of the cone so rapidly as to make it quite impossible to count their number; with others, and in different circumstances, they follow each other at distances of several millimetres apart at a comparatively moderate rate, according as the head is greater or less.

(3) shows a tube held in a vertical position, (4) shows it held at an angle. In the former the drop encircles the cone symmetrically, in the latter it has gravitated round to the lower side.

The force which draws the water up on the *outside* of the cone in opposition to the force of gravity is obviously a function of the gradually increasing mass, and consequently of the gradually increasing attraction, of the cone.

The ratio of the weight of the salt to the weight of the decrement in the columns of solution of some salts is a *constant*. The ratio of the square root of the molecular weight of some salts (multiplied or divided by 1, 2, or 4), to the square root of the molecular weight of water multiplied by 4, is equal to the ratio of the weight of each of the same salts contained in its solution in water in a capillary column, to the weight of the decrement in water in the same column.

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Scattering of Electrons in Ionised Gases.

IN the November 1925 issue of the *Physical Review*, Langmuir published an investigation under the above title. From the collector characteristics of a mercury vapour discharge with a hot cathode, it was concluded that, in the tube, electrons must have been present with abnormally high velocities. Langmuir expressly mentions that with these discharges no oscillations could be found. In several experiments which were made by me in consequence of this publication, oscillations could in fact be detected. In accordance with my results, summarised below, it does not seem impossible that the observed "scattering of primary electrons" is always accompanied and caused by these oscillations.

1. A small metal plate, connected to a crystal detector, was placed in the immediate neighbourhood of a tube, similar to the one used by Langmuir. A galvanometer, shunted by the crystal detector, showed a deflexion at the larger current densities, when the electron velocities became abnormal.

2. To screen off the influence of the glass walls a tube was built in which the anode completely surrounded the filament. Only a few small holes (diameter 0·5 mm.) were drilled in it, in front of a collector. In this tube also the velocities became abnormal at the larger current densities, when again simultaneously oscillations could be detected. With appropriate values of emission, anode voltage, and pressure, these oscillations could be brought on a Lecher system. As wave-lengths, values from 40 cm. to 100 cm. were obtained.

3. A similar tube was used for experiments with argon. Here also, under favourable conditions, the Lecher system could be used and showed wave-lengths of the same order of magnitude.

4. With the argon experiments under certain conditions of pressure, etc., it was observed that the steady state of the discharge was only reached a considerable time after the anode voltage was switched on. During the first few minutes, neither abnormal velocities nor oscillations could be observed. Then suddenly the final state was reached in a discontinuous way. At this moment, the electron velocities became abnormal (max. about 20 volts), and simultaneously the detector galvanometer showed a deflexion.

5. Finally, the relation between the abnormal velocities and the distance through which the electrons had gone was investigated. With a tube as described under (2) above, the collector of which could be moved, it appeared that the electron velocities did not become more and more abnormal with greater collector distances, but the reverse happened. This also is not in agreement with the explanation suggested by Langmuir.

A more detailed description of the experiments will be published in the Dutch periodical *Physica*.

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