which are to be applied during the next twenty years for the encouragement of scientific research by women in mathematical, physical and natural sciences.

Dr. G. Canby Robinson, dean of Washington University Medical School, St. Louis, has resigned to accept a position as dean and professor of medicine in Vanderbilt University, Nashville, Tenn.

Dr. Arthur M. Pardee, professor of chemistry at Washington and Jefferson College, has been appointed professor of chemistry and head of the department at the University of South Dakota to take effect next September.

The *British Medical Journal* states that in the appointment of professors to German universities precedence is at present being given to university teachers who have left towns which have passed out of Germany's possession. The anatomist, Professor Hugo Fuchs, who had recently been appointed to Königsberg, has thus been transferred to Göttingen as Merkel's successor.

DISCUSSION AND CORRESPONDENCE

IONIZATION AND RADIATION

Recently I came across a communication by Professor R. A. Houstoun[1] in which it was proposed to explain ionization of gases by X-rays on the basis of the classical conception of electrodynamics, by considering the intereference of spherical wavelets in which the phases are distributed at random. Professor Houstoun stated:

> When X-rays pass through a gas, only a very small fraction of the molecules—in favorable circumstances, one in a billion—is ionized by them, and the extent of this ionization is unaffected by temperature. Writers on radiation seem to have difficulty in reconciling this with the wave theory of light. I venture to suggest that the difficulty arises from an imperfect comprehension of what the wave theory requires.

After applying Rayleigh's solution of the problem of the phases at random to ionization, he arrived at the conclusion:

> Thus it is not necessary to assume that X-rays consist of neutral atoms, or that the ether has a fibrous structure, or to take refuge in the nebulous phraseology of the quantum theory; the explanation follows naturally from the principle of interference as expounded by Fresnel.

This explanation of ionization occurred to me some ten years ago but I had soon to abandon it because it led to results which are at variance with facts.

Let I/r^2 denote the intensity in a wavelet at a distance r from the source, and n be the number of wavelets coincident at that distance. Then the probability of a resultant intensity greater than J is given by

$$e^{-(Jr^2/nI)}.$$

Therefore if J equals the minimum intensity necessary to ionize the molecules of a gas, the number of molecules ionized is proportional to this expression. Thus on this theory the intensity of ionization of a gas falls off exponentially as its distance from the source of X-rays is increased—a result which is contrary to the experimental fact that the intensity of ionization varies inversely as the square of the distance.

H. M. Dadourian

Trinity College

HOW DID DARWIN WORK?

Last year Professor Francis B. Sumner published a very suggestive and interesting paper in *The Scientific Monthly* for March, dealing with "Some Perils which confront us as Scientists." In it he quoted with approval an indignant query: "Under what project did Darwin work?"—and again, "one wonders what institution or organization Newton or Darwin belong to." The solitary worker of Down seems the incarnation of scientific genius illuminating the world with the products of its own combustion. On closer inspection, however, this conception is seen to be illusory. In the whole history of science there has perhaps never been a man who worked more faithfully and persistently on a project. It was his own project to be sure; but none the less a definite project. So also,

[1] *Nature*, April 24, 1919.