BIOLOGICAL ISOMERISM OF WATER MADE OF PROTIUM AND DEUTERIUM

THE discovery of the hydrogen isotopes of mass one (protium) and mass two (deuterium) opened an interesting and fruitful field for investigations not only in physics and chemistry but also in biology. The recent report of Professor Gilbert N. Lewis in the August issue of the *Journal of the American Chemical Society* indicates that water containing 100 per cent. of $H_2{}^2O$ does not cause the seeds of tobacco to sprout.

The process of germination in seeds or spores is usually associated with the penetration of water through the seed coat and the protoplasm membrane. The absence of germination may be explained, therefore, on the assumption that the $H_2{}^2O$ molecules are stopped by an organic tissue, which at the same time is permeable to $H_2{}^1O$ molecules. If such selective transmission is taking place also at the surface of the primary and secondary roots, then the water content of a plant must be composed of water containing only protium, whereas the water on which the plant was fed will be relatively more abundant in deuterium. It would be of great interest to analyze the water distilled from different plants in various stages of their growth.

Another possibility is that the heavy water is able to penetrate the seed coat but does not participate in the process of cell division, *i.e.*, germination and growth. If heavy water has a lethal action, then it is to be expected that feeding a seed on water containing only protium will result in a more rapid development.

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THE SPIRAL HABIT

REFERRING to the wonderfully interesting article entitled "More about the Spiral Habit," by Professor William Seifriz, appearing in the October 20 issue of SCIENCE, in which the author traced the "spiral habit" all the way up from protoplasm, may I add the further interesting suggestion that this same "spiral habit" seems to be deeply ingrained in all nature; as it seems to be clearly in action, in the wave-shape of light in the "ether" body of conductance—so much for the wave motion of the "ether molecules"; and, so far as I know, the wave motion is still best explained by the old theories of Fresnel and his classic school of the experimental action of light.

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SPECIAL CORRESPONDENCE

ACADEMIC FREEDOM IN GERMANY

A CORRESPONDENT writes from abroad to the editor of SCIENCE:

As an old "Frontkämpfer" for academic freedom, I am sure you will be interested in the enclosed abstract of the new constitution for the Bavarian universities if you have not seen it. I don't suppose the wrecking of the freest and most self-respecting of all communities of scholars will create much excitement in America, where we have always had what might be termed in the new parlance "a managed university." But those of us who have hoped for a freer and more liberal form of administration as our educational system comes of age will be distinctly depressed by this regressive step on the part of the Nazi Government. Apparently, all that has been gained since academic freedom was first evolved and practised in Göttingen and Halle nearly two centuries ago has been lost.

Most Americans will probably be surprised to learn that academic freedom was guaranteed by the Weimar Constitution in a section that read, "Science and its teaching shall be free." No German politician can claim that German universities have not met every obligation, real or implied, owed either to the state or society, but the present rulers of Germany are apparently taking no chances on sedition brewing where thought once was and should be free.

It is a dubious compliment the Bavarian Minister has paid us in copying some of the worst features of American university administration. Practises that may, perhaps, be excused or, at least, understood in a young country with a rapidly growing population and expanding educational system are not the measures to imitate and incorporate into what were, probably, the best universities that the world has thus far produced. By its action, the Hitler Government has dealt them a fatal blow. Under a system such as the new constitution imposes, disintegration of the morale of the universities is inevitable. Scholars, trained in freedom, who have worked in the liberal atmosphere previously existing in the German universities, will hardly remain productive under a system suggestive of military oversight and control. Any kind of intellectual thralldom—particularly political—is alien to all the principles conducive to the development of great scholars. One wonders whether another Parthenon has not been destroyed.

The idea of students sitting in the university senate approaches the ridiculous. Students rarely know what is good for them. Moreover, the faculty always