erature of endocrinology is replete with reports of the effects of adrenin and other similar preparations used as drugs and with inferences drawn therefrom as to their physiological action. Gley has stressed the dangers of that mode of thinking.[2] It is because such reasoning may lead to error that I called attention to Cori's use of it in a recent article in *Physiological Reviews*.[3]

Cori declares that in his experiments the absorption of adrenin from subcutaneous tissue "must proceed at a rate less than 0.001 mg per k per min." He marks that Cannon regards that rate as within the physiological range of adrenin secretion. There is evidence that it is within the physiological range, but only during and immediately after a short stimulation of the adrenal glands. There is no evidence that it continues at that rate. Recent work in the Harvard Physiological Laboratory by Colwell[4] has shown that continuous intravenous injection of adrenin into the cat at the rate of 0.001 mg per k per min. produces profound pathological effects on carbohydrate metabolism. Recently in the same laboratory Dworkin has demonstrated that when the sympathico-adrenal system liberates sugar physiologically, the hyperglycemia long outlasts the discharge of adrenin. The adrenin promptly disappears from the blood and leaves sugar utilization undisturbed. The continuous prolonged absorption of adrenin studied by Cori does not represent, therefore, a physiological process, and consequently the results obtained by means of it can not be regarded as normal.

Cannon pointed out that Cori's injection in rats would be the equivalent of 14 mg of adrenin in a man of 70 k. Cori objects to this reference to man. Let us consider rabbits. Trendelenburg[5] has shown that in rabbits a continuous intravenous injection of between 0.0001 and 0.0003 mg of adrenin per k per min. produces hyperglycemia and glycosuria. If the dose given by Cori—0.2 mg per k—were absorbed at the rate which, according to Trendelenburg, is capable of producing hyperglycemia and glycosuria, from eleven to thirty-three hours would be required for the absorption. Cori reports that in his experiments "hyperglycemia and glycosuria were present after one hour and persisted for four hours after the injection." He cites his recent tests which show that 35 per cent. of the adrenin he injects disappears during the first hour and 13 per cent. during the second hour. How these results are to be reconciled with his belief that there was in his experiments "a rather constant rate of absorption" is not clear. Neither he nor anybody else knows exactly how fast the adrenin enters the blood stream. On the basis of his own figures, however, the average rate of absorption during the first hour would be not less than 0.001 mg per k per min., as he has claimed, but more than that—*i.e.*, more than ten times the amount which Trendelenburg found was adequate for producing hyperglycemia and glycosuria and actually more than the amount which in Colwell's studies caused a striking pathological disturbance.

My sole interest in calling attention to the use of what can reasonably be regarded as huge doses of powerful endocrine products in experiments is to prevent physiological literature from being encumbered with misleading inferences. The giving of doses many times the minimal effective dose, the use of such doses subcutaneously with the idea that the rate of their absorption can be accurately known and the employment of a potent agency to act continuously for a long period whereas under normal conditions it does not so act, will, no doubt, yield data. Until such data, however, have been confirmed by experiments performed under more natural conditions, they should be interpreted cautiously in physiological terms.

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[2] E. Gley, "Les Sécrétions Internes," Paris, 1920, 93.
[3] W. B. Cannon, *Physiol. Rev.*, 9: 399, 1929.
[4] A. R. Colwell. Papers to appear soon in the *Amer. Journ. Physiol.*
[5] P. Trendelenburg, *Pflüger's Arch.*, 201: 39, 1923.

A PECULIAR LIGHTNING PHENOMENON

ON Monday afternoon, August 28, my brother and I were in the vicinity of Peoria, Illinois. The afternoon had been rainy, with two thunder-storms. The second storm was still raging with sharp lightning and the rain was falling in torrents but there was no wind. Just as we were ascending a gentle slope a very brilliant lightning flash occurred; the thunder was so violent that we both felt the mechanical shock as if the car had been shaken and each felt the electrical shock especially in the shoulders.

The flash appeared to be just on our right in an open pasture crossed by what was once an osage hedge, but now only a few small trees of the hedge remained at intervals of twenty to thirty feet. About six feet from the trunk of one of these hedge trees we observed a ball of smoke about two feet above the ground. The ball appeared to be about eighteen inches in diameter and perfectly spherical. The color of this smoke, if it was smoke, was a yellowish brown quite similar to the smoke given off by burning straw. The ball began immediately to diffuse into the surrounding air just as the smoke from an exploding shell.

The storm being so forbidding, we did not care to investigate the spot at the time but we returned three days afterwards and searched very carefully and minutely for some evidence that the lightning had

struck in the vicinity of the ball of smoke. Not the slightest trace of any disturbance could be found. We could not find even a withered twig or leaf. It was first thought that the smoke might have been produced by the lightning having burned some of the limbs or weeds. If any crack or disturbance of a small character had been formed in the bare ground it would have been obliterated by the heavy rain. Evidently the ball could not have been composed of dust, for it had been raining for about two hours. We measured the distance from our car to the place where the ball had appeared and found it to be about one hundred feet. We raised the question of whether or not this "ball of smoke" would have been a "ball of fire" if the phenomenon had taken place after dark.

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THE PUBLIC FUNDS

I READ in the newspaper of the enormous sums of money which can be saved to the United States, as well as to other countries, if President Hoover's policies can be adopted. In the interests of peace and prosperity, he should surely receive our support; but I believe the issue would be clarified and vivified if we could feel assured that the saved resources, or some reasonable part of them, would be devoted to the support of specific undertakings of a useful character. Thus, from my particular angle, I think how small a fraction of the funds referred to would be entirely adequate to provide for the compilation, editing and publication of a North American Fauna. How little it would require, comparatively speaking, to enable entomologists to explore the world for scale insects and mealy-bugs and their natural enemies, and describe the results, to the great advantage of agriculture and horticulture. What small sums, in proportion to the proposed savings, would suffice to provide popular books on natural history for all sections of the country, cheap and well illustrated, contributing everywhere to the culture of the people. Could the president appoint a committee, sufficiently varied in its character, to receive and report on desirable projects, for the purpose of causing people to sense the possibilities before them? Many would be proposed, but enough might be adopted to keep us hopeful and interested, and alive to the value of our resources.

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THE PUBLICATION OF PAPERS FROM RESEARCH INSTITUTIONS

IN the introduction to Volume II of the Abridged Scientific Publications from the research laboratory of the Eastman Kodak Company, which was written in May, 1917, the following passage occurs:

> In our opinion, it is undesirable for a research laboratory to confine its publications to a privately issued bulletin, and it is better for scientific papers to be published in the usual scientific and technical journals, where they are accessible to all those interested in the branch of science concerned.

This was a protest against the publication by research institutions of their own journals, in which the papers produced by the laboratory appear. Unfortunately, the views expressed in that note have not been shared by the directors of other research laboratories, and the number of special journals continues to increase, these journals being filled with papers from many branches of science, so that they place a severe burden upon the abstractor and bibliographer.

Recently, an even more serious difficulty has appeared, since the editors of these journals, in their anxiety to obtain material which shall make it necessary for libraries to take their journals, have begun to insist on the right of prior or simultaneous publication. The result of this is that papers read before meetings of some scientific societies are actually unavailable for the journals of these societies, since they reprint papers which have already been published, and the journals of the laboratories insist on prior publication of the papers.

The society journals can, of course, retaliate and demand prior publication, but in view of the commercial interests involved this would mean that a large number of scientific papers would be unavailable at society meetings.

It appears to me that it is desirable that laboratories which have already established journals should allow papers read at society meetings to be published first by the society in question and, secondly, that new research laboratories which have not already published their own journals should refrain from doing so and support the existing scientific journals with their material, and, if possible, with some of the funds which the publication of their own journal would have involved.

In order to make available all the material from the same institution in a collected form, since they will naturally have some common interest, the papers can be reprinted annually in a volume—either in whole or in the form of abridgments—a practice which has been followed with success by our laboratory for the last fifteen years.

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EASTMAN KODAK COMPANY