It seems that Russell's idea of a correlation between frost action and some one isotherm has merit. Frost action is doubtless of great importance in the asymmetry of valleys in humid lands, though perhaps of less importance in arid regions.

In the North America Continent nearly all the area north of the isotherm of 32° is glaciated and only post-glacial valleys can show asymmetry. Many of these are, however, too youthful. It may be that all the humid area north of the isotherm where frost action is prevalent would in turn develop asymmetry. Obviously the nearly unglaciated northern portion of Asia is the region for testing this question. Asymmetry in the valleys of the northward flowing rivers of Siberia has already been reported and attributed to right-hand deflection. The characteristic of smaller valleys, so far inadequately described, would appear to be critical.

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METEORIC DUST

SCIENCE NEWS, in SCIENCE for January 22, contains an article on "Meteoric Dust," to one paragraph of which I feel bound to take exception.

It is not a fact that I have been collecting meteoric dust "over a period of thirty years." Of course, meteoric dust, like rain, falls alike on the just and the unjust; but that is not scientific collecting.

It is true that certain samples of dust, from roofs, towers, flues and locomotive smoke boxes, have been examined by me, using quite simple, even crude apparatus. In the outdoor dusts there were found both magnetic globules and glassy globules. Flues of anthracite furnaces show occasional magnetic globules, and the dust from locomotive smoke boxes contains them in large proportion, whence I take it that locomotives are efficient, if not sufficient, producers of the magnetic globules in atmospheric dust.

The glassy globules appear in dusts from house roofs and towers; *e. g.,* in deposits on the flat roof of Building C, Harvard College Observatory, where they are in the winnowings of thirty years; in dust from a house roof in Chippewa Falls, Wisconsin; and in the dust on the upper platforms of the Pilgrim Memorial Tower, Provincetown, Massachusetts.

Such globules were reported by Thoulet in 1908 as existing in the dust from towers of the cathedral in Nancy, France. I do not find them in anthracite flues or in locomotive dusts. But I have not examined dusts from glass works or from mineral wool factories; and the samples from locomotives have been too few for generalization. Some well-equipped mineralogist might pursue the subject to advantage.

Until some one discovers a criterion for the identification of meteoric dust, the only course is the exclusion of alternatives. This exclusion seems to be satisfactory in three cases: the sample from the ship *Joshua Bates,* studied by Ehrenberg, the magnetic globules of Murray and Renard, found in the "red clay" deposits of the deepest seas, and the sample collected on November 16 and 17, 1897, in Dublin, Ireland, and analyzed spectroscopically by Hartley and Ramage.

Thoulet was probably hasty in assigning a cosmic origin to the Nancy globules; and a considerable search for alternatives is necessary before calling the glassy globules which I have found meteoric or cosmic.

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THE OESTRUS-PRODUCING HORMONES

THE recent note by Marrian and Butenandt[1] contains several statements which can hardly be substantiated if one refers to our original papers. Our first paper[2] on theelol appeared in the October issue of the 1930–31 *Proceedings* of the Society of Experimental Biology and Medicine and Marrian's[3] paper was received by us on October 28, 1930. We characterized the triol as an unsaturated trihydroxy compound having a formula $C_{18}H_{24}O_3$ and a melting-point of 273° C. The tri-acetyl derivative had a melting-point of 126° C. In a later paper,[4] the one about which Marrian and Butenandt complain, Marrian's data are compared with ours in adjacent columns of Table I and some discussion is given in the text. The table contains Marrian's carbon and hydrogen analysis, the molecular weight, melting-point, formula and the fact that Marrian found 3 hydroxyls per molecule. In the text we expressed the belief that Marrian might have an isomeric triol or an impure triol and that, if the latter were true, the contaminating substance might be theelin.

It is also stated that we have ignored the evidence of Marrian's analytical data. We doubt whether carbon and hydrogen analyses would detect the presence of amounts of theelin ($C_{18}H_{22}O_2$) up to 10 per cent in otherwise pure theelol ($C_{18}H_{24}O_3$), whereas the melting-point would certainly reveal the presence of the impurity. In our preparations we have frequently obtained about ten times as much theelol as theelin.

The complaint that Butenandt's conversion of $C_{18}H_{24}O_3$ to $C_{18}H_{22}O_2$ has not been properly recog-

[1] G. F. Marrian and A. Butenandt, SCIENCE, 74, 547, 1931.

[2] E. A. Doisy, *et al., Proc. Soc. Expt. Biol. and Med.* 28, 88, 1930.

[3] G. F. Marrian, *Biochem. J.,* 24, 1021, 1930.

[4] S. A. Thayer, L. Levin and E. A. Doisy, *J. Biol. Chem.,* 91, 655, 1931; E. A. Doisy and S. A. Thayer, *J. Biol. Chem.,* 91, 641, 1931.

nized likewise seems to have little foundation. To be sure, the passage in which the conversion is mentioned appears in an unusual place, but it is the unusual rather than the commonplace that attracts attention. An addendum to our paper contains the reference to his experiments.

Since this note is a presentation of our views on points raised by Marrian and Butenandt perhaps we may be accorded the privilege of commenting upon another phase of the matter.

At times we are mildly annoyed by the statements that are attributed to us by others writing on the follicular hormone. For example, both Laqueur[5] and Butenandt[6] state that we found a potency of 8,000,000 mouse units per gram of theelin. Actually, we have reported from 2,500–4,000 *rat units* per milligram and each investigator has converted these figures to mouse units, using such conversion factor as seemed most probable to him. Recently, we have for the first time assayed our crystalline theelin according to Butenandt's procedure (a single injection of a solution in sesame oil) and obtained a value much greater than 8,000,000 mouse units per gram.

As another example, both Marrian[3] and Butenandt[7] have stated that we gave to theelin the formula $C_{18}H_{23}O_2$, whereas what we actually stated in a brief preliminary note was: "Average, C 79.69 per cent; H 8.49 per cent; O 11.82 per cent. These data give an empirical formula of $C_{18}H_{23}O_2$ with a molecular weight of 271, which corresponds with the data of the table." Any organic chemist would know that either $C_{18}H_{22}O_2$ or $C_{18}H_{24}O_2$ is possible and more probable. Apparently the data were not recalculated or the wording of our statement would have been more apparent. Such corrections might be made *ad infinitum* if we allow our grievances to annoy us.

We have been both amazed and pleased with the investigations which seemed to have hinged at least in part upon the introduction of the vaginal smear bioassay procedure.[8] Others being interested in the same general problem increases one's interest in his own work, and it has been a source of extreme gratification that so many investigators have become interested in the "ovarian hormone" problem.

The interests of the workers of this laboratory have been mainly chemical and we have endeavored to contribute our bit, at the same time recognizing the contributions of others. If the outstanding results of Marrian and Butenandt have not been adequately recognized in our previous papers, we are sincerely regretful, since it is farthest from our desire to attain recognition by detracting from the works of others.

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[5] E. Dingemanse, S. E. deJongh, S. Kober and E. Laqueur, *Deutsch. med. Woch.*, 56, 301, 1930.
[6] A. Butenandt, *Zeit. f. physiol. Chem.*, 188, 1, 1930.
[7] A. Butenandt, Abhandlungen d. Gesellschaft d. Wissenschaften z. Göttingen. III Folge, Heft 2, 1931.
[8] E. Allen and E. A. Doisy, *J. Am. Med. Assn.*, 81, 819, 1923.

STALACTITES AND STALAGMITES GROWING ABOVE GROUND

AN interesting occurrence of stalactities and stalagmites forming above ground has been noted by the writer. More than three hundred stalactites and a number of stalagmites, in all stages of development, are growing from the roof of a railroad bridge in the city of Wooster, Ohio.

The rain water which falls upon the bridge percolates through four feet of limestone ballast and a foot of cement before it finds its way through the joints between the steel plates to the ground below The largest stalactite is twelve and one half inches long and about one half inch in diameter. There are many others more than six inches in length.

During the summer of 1919 the bridge was cleaned and painted. The stalactites are, therefore, not more than twelve years old. Where the water has dripped on the steel girders below a number of stalagmites have formed. Several of these are from an inch and one half to two and one half inches long. The solution is of high concentration and the rate of evaporation is high; consequently the stalactites are growing rapidly. Their great number affords an excellent opportunity to study them in all stages of development. In the near future the writer expects to publish the results of his observations.

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ENTOPTIC COLORS

THE entoptic colors described by Elmer F. Way as occurring during the operation of a motion picture projector at reduced speed, may perhaps be an instance of the phenomenon known as Fechner's colors. If a disk, partly black and partly white, be rotated slowly on a color wheel under bright illumination, a flickering play of colors appears on the surface. The proportions of black and white and the speed of rotation necessary to give the best results depend upon conditions, but a speed of two to five rotations per second is usually satisfactory.

This phenomenon is described by Charles S. Myers in his "Text-book of Experimental Psychology," part I, page 81.

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