ing forest fires with seaplanes, camping in the Rockies and other aspects of life in the Empire. Films of how people live and how the Empire's food is raised in other Dominions and in several of the Colonies are included in the catalogue. Over 2,000,000 people, of whom about half were school children, have now attended the Imperial Institute cinema at Kensington, where the Empire Marketing Board films are shown continuously. One of these pictures is described as a "dramatized lesson in economic history," and shows, in a series of swift, vivid flashes, the development of the North American prairies. Another is a one-reel version of *Drifters,* a film epic of the North Sea.

FORTY of the states and territories will spend a total of $201,917 for growing and distributing trees for planting of farm forests in 1932, according to budget figures received by A. B. Hastings, chief of state cooperation in the forest service. The federal government will allot $73,288 to these states under the cooperative farm-forest planting clause of the Clarke-McNary Act. The cooperating states have budgeted $645,298 for various forest-tree production and distribution purposes for the fiscal year 1932, which is only about $5,000 less than the 1931 total. About 31 per cent. of the total state funds will be used for farm-forest planting arrangements in which the federal government is cooperating. In addition to the $73,288 in federal allotments for 1932, $3,150 is to be available for administrative purposes and $18,561 as a contingent fund for allotments to new states entering the cooperative arrangements, making a total federal budget of $95,000 for aid in farm forestation. With the 1931 state and federal funds the states furnished approximately 25,000,000 trees for planting in farm forests. Comparatively large increases in cooperative state funds devoted to farm-forest planting projects were budgeted in New Jersey, Indiana, Florida, Nebraska, Louisiana, Oklahoma, Pennsylvania and South Carolina, with lesser increases in Delaware, Maryland, Washington, Michigan and Wisconsin.

# DISCUSSION

## ASYMMETRIC VALLEYS AND CLIMATIC BOUNDARIES

IN a recent article in SCIENCE[1] Russell discusses the coincidence of position of the January isotherm of 32° F. with certain asymmetric valleys having the steeper slopes facing north. The writers believe that Russell is correct in emphasizing climatic conditions as a cause for asymmetry and in considering the freezing of soil water as of great importance. They doubt, however, that he has established any association between a given type of asymmetry and any isothermal line.

In enumerating the causes of asymmetry, Russell neglected to mention the factor of stream deflection due to the earth's rotation. This factor was given more consideration by Gilbert and his contemporaries than is now customary. However, before climatic generalizations are established, asymmetric valleys attributed to this cause must be satisfactorily eliminated. One of the best known examples lies on the January isotherm of 32° F. and one lies far south.

Fuller,[2] in regard to asymmetric valleys of southern Long Island, declares that a full four fifths of these valleys have a steeper western slope. In his opinion, the deflection hypothesis of the early workers is the best explanation available. On Martha's Vineyard are similar valleys to which the same argument is applicable. Thus we have, directly under the isothermal line in question, examples of an asymmetry apparently unrelated to climatic conditions.

The marked asymmetry of the valleys of the coastal plain of North and South Carolina is characterized by steeper, north-facing slopes. These valleys lie several hundred miles south of Russell's line and nearer the January isotherm of 40° F. According to Kerr,[3] these valleys are due to right-hand deflection of streams.

The detailed, irregular, isothermal line on Russell's maps[4] appears to cross the Pajarito Plateau of New Mexico, described by Henderson.[5] Here are asymmetric valleys with the steeper slope facing the south. A comparison of Henderson's description with Culbertson's[6] description of the wooded, asymmetric valleys of southern Indiana brings out clearly how—along the same (January, 32° F.) isothermal line—the same processes may produce diametrically opposite results in arid and in humid climates.

Asymmetry is not uncommon in arid regions and has been observed by Bryan at many localities in southern Arizona. Generally the south side of the valley has the gentler slope and is marked by heavier vegetation. The interrelation seems obvious: shelter from the sun's rays decreases soil evaporation and transpiration; consequently plants thrive and in turn protect the slope from the violent erosive action which makes the north slope bare and steep.

[1] R. J. Russell, "Geomorphological Evidence of a Climatic Boundary," SCIENCE, 74: 484–495, 1931.

[2] M. L. Fuller, "Geology of Long Island," Prof. Paper 82: 50, 1914.

[3] W. C. Kerr, "Topography as Affected by Rotation of the Earth," *Proc. Am. Phil. Soc.,* 13: 190–192, 1873.

[4] R. J. Russell, "Dry Climates of the United States: I, Climatic Map," *Univ. Calif. Publ. Geog.,* 5: 1–41, 1931.

[5] E. L. Hewett, J. Henderson, W. W. Robbins, "Physiography of the Rio Grande Valley, N. M., etc.," *Bull. Bur. Amer. Ethnol.,* 54: 1913.

[6] G. Culbertson, "Some Evidence Indicating the Importance of Frost Action in Widening Valleys," *Proc. Ind. Acad. Sci.,* 1899: 167–170, 1900.

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.