

of 84 cents a page. In addition he is a subscriber to the Journal at \$6.50 a year.

In contrast we see that the "popular" magazines flourish as never before and publish beautiful color illustrations galore. We are told that scientific periodicals can not have these things because *they* don't pay." We wonder, Does not science pay to-day as well as in 1917? Will it "pay" to let the scientific world send to Leipzig for its periodicals, rather than to Baltimore?

If scientific publications are to survive and if this country is to support scientific work as it supports other things, there must be some form of endowment for that purpose. Corporations and individuals whose business is even remotely connected with the results of scientific work will find it a good investment in years to come.

The scientists are willing, and do, bear more than their share of the expense of their publications, but outside help is necessary. These periodicals can not expect to pay dividends to the publisher because they are unattractive to advertisers as a class. The technical and scientific periodicals need endowments sufficient to allow them to present adequately the results of research and to enable them to circulate at a subscription price low enough to enable all workers and libraries to buy them.

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ROAD REFLECTIONS

TO THE EDITOR OF SCIENCE: Referring again to the subject of road reflections, Mr. Freeman F. Burr in SCIENCE for September 24 notes having observed reflections occurring at considerable heights above the surface of the road. I have made thousands of careful observations of this phenomenon and have found that the reflecting surface always coincides with the road surface as closely as the eye can determine.

Since the true surface disappears when a reflection takes place there is often an appearance of shifting which careful observation

shows to be illusory. Thus a reflecting surface on the top of a hill sometimes seems at a casual glance to be several inches from the road and seems to hide objects beyond. In every such case the hill itself is what cuts off the vision.

I have observed the reflections many times under circumstances that preclude entirely the ascribing of them to warm layers of air. I have seen them on cloudy days, on shaded stretches of road and in one place where a white sign-board furnishes a convenient background a very striking reflection may be seen long after sunset.

To be sure they are much more in evidence on bright days than on dull days, but since they appear even more brilliantly on a very cold bright winter day with snow on the ground than on a warm summer day the conclusion to be drawn is that the contrast of bright colors throws the reflections into more prominent relief on sunny days.

The same phenomenon may be observed by holding any smooth normally non-reflecting surface, such as that of tarnished metal or of a smooth whetstone, at a small angle to the line of vision. Objects beyond appear brilliantly reflected as if in a mirror.

It may be that in some instances a thin air layer immediately adjacent the surface aids by bending some incident rays so that they strike within the critical reflection angle. But the air layer certainly is never primarily responsible for reflections of this kind.

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THE INFLUENCE OF FRESH FOOD IN LACTATION

THE suggestion of Hart, Steenbock and Hoppert, in the October 1 number of this journal, that a vitamine in fresh grass favorably influences calcium metabolism is a step in a direction in which, I am convinced, important progress is to be made.

Through extensive investigations on the mineral metabolism of farm animals I had reached a hypothesis identical with the provisional conclusion of Hart and associates,

and had planned work to reveal the facts. Fortunately the department of dairy husbandry of this institution, under the leadership of Professor C. C. Hayden, has had in progress for many years an investigation with dairy cows contributing evidence directly on this subject; and during the past summer the writer has had under observation this same group of cows on which he was conducting mineral feeding experiments.

Mr. Hayden permits me to make the following observations on these cows. Since 1911 a group of Holstein-Friesian cows has been maintained on dry feeds and silage alone. No green feed has been allowed. Several of the animals now in this group were born in the same and have grown to full maturity without having a bite of green feed. Extensive evidence is at hand, therefore, as to the importance of the suggestion of Hart and associates, as bearing on lactation in cattle.

This group of cows has grown to normal weights, and has produced and reared calves without marked or certain irregularity or abnormality. The milk production has been fair only, it being obvious that with normal treatment these cows would have given more milk. They do not have normally keen appetites and some are easily forced off feed. They will not eat enough feed to support maximum milk production. They fall away during lactation a little more than is customary, but pick up again after going dry. These cows have been in noticeably less thrifty condition, as indicated by flesh and coats, than the balance of the herd, which goes to pasture, and it has been apparent that they crave something which they do not find in the ration.

During the past summer the writer has conducted palatability tests on these cows, with various mineral supplements. They have manifested a keen desire for mineral feeds, having eaten, in several short periods, from approximately three fourths of a pound to more than one and a fourth pounds of mineral supplement per head per day. These supplements have consisted of various calcium phos-

phate and carbonate preparations, fed alone or mixed with common salt. It has been shown that the desire of the cows for these feeds has not been wholly or predominantly due to the liking for salt. The avidity with which these cows eat steamed bone, considered in connection with our finding that negative calcium balances normally prevail during lactation in cows on dry feed, and the conclusion of Hart and associates that fresh grass favorably affects calcium retention, suggests that these dry-fed cows are in a state of mineral depletion, especially while giving milk.

It appears, therefore, that the suggestion of Hart and associates is a matter of practical importance as relating to milk production, but that rations of dry feeds and silage, though probably deficient in some constituent, are not entirely lacking in any essential.

The most important work indicating the dependence of calcium metabolism, especially of the teeth, upon vitamins, which has come to the writer's attention is an extensive and unusually successful investigation with guinea pigs (as yet unpublished) by Dr. Percy R. Howe, of Harvard University.

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SWARMING OF ANOPHELES

TO THE EDITOR OF SCIENCE: It may seem a little late to publish this note, but, on account of a long absence from the country, I have only just seen reference, in the *Review of Applied Entomology* for May, 1920, to Mr. C. S. Banks's article entitled "The Swarming of Anopheline Mosquitoes" published in the *Philippine Journal of Science* for September, 1919. Mr. Banks is quoted as stating in the article that, although the swarming of mosquitoes has been constantly reported, "no mention seems previously to have been made of this habit in the case of Anophelines." As a matter of fact the late Mr. Frederick Knab published in *Psyche* for February, 1907, a rather extended note on the swarming of *Anopheles maculipennis* Say. This note is reprinted in full in the Monograph of the