tion might seem to have supernatural connotations, to psychological tests in the field of perception and apperception, such as the Rorschach Technique and the Harvard Thematic Apperception Test.

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Meteor Trails on the Moon

In *Science* (1946, 104, 448) there is a letter from James Bartlett, Jr., explaining his concept of what N. J. Giddings, of Riverside, California, saw and described as "flashes streaking across the moon." I should like to discuss briefly Mr. Bartlett's explanation and show not only that it is contradictory to simple facts that can be secured by careful observation of the new moon at twilight, but that his statement that the meteorite trails would be visible only with the dark surface of the moon as a background is quite in error.

First, the new moon, if observed carefully, will be found to show, up to the fifth or sixth day, the usual "earth shine" phenomenon; the side that is not directly illuminated by the sun is not entirely dark, but reflects secondarily light that has first been reflected from the earth. Thus, the "dark" portion of the moon is actually lighter than the surrounding sky, and if meteor trails were visible against the "earth shine" illuminated disc, they certainly could be seen against the surrounding darker sky.

Accordingly, Mr. Bartlett's statement that the meteor trails "would be visible for *just that portion of their path* which had the dark side as its background" is thought to be quite in error, as the "dark side" of the moon is at least no darker than any other nearby part of the sky and is usually somewhat lighter due to "earth shine." Thus, a meteor would, in theory at least, be no more visible over the moon's darkened disc than elsewhere in the sky and would possibly be less so, if of a very faint magnitude.

Whatever might be the true explanation of Giddings' observation, I feel Mr. Bartlett's theory, although ingenious, is fundamentally unsound.

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The communication from James C. Bartlett, Jr., concerning the projection of meteor trails on the moon (*Science*, 1946, 104, 448) reopens the fascinating possibility originally observed and reported by N. J. Giddings (*Science*, 1946, 104, 146).

However fascinating the original observation was, the reasoning followed by Bartlett is even more amazing. He says, in substance, that meteors entering the earth's atmosphere would not have been seen against the bright sky but, crossing the *dark* surface of the moon, would be visible.

How is this dark surface of the moon to shine darkly through the scattered atmospheric light which comprises the sky? Is this some new and visible manifestation of the "black light" we so often see headlined in the popular press? Bringing the dark portion of the crescent moon to this side of the sky so that it can be darker than the sky reminds one of the pictures of the hornéd moon with star embraced therein.

Records of previous observations of lunar flashes would be timely, as well as a written, brief, and "courteous discounting" by the authority first consulted by Giddings.

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On the Concepts of Mitosis

A lag exists between our concepts of mitosis as taught at the elementary and graduate levels and the picture as it has emerged in the last decade. The average biologist thinks of nucleolus and chromosomes as lying free and unoriented in the karyolymph and of the metaphase plate as the product of forces of attraction and repulsion between chromosomes and central bodies operating in a more or less uniform field.

For 10 years I have been analyzing the movements of nuclear chromatin in relation to the topography and movements of the cytoplasmic elements in the grasshopper follicle and onion-root tip meristem. Several important features have come to light:

(1) The centromere, and often the telomere regions, maintain association with the nuclear membrane throughout the interphase or "resting" condition.

(2) The nuclear membrane plays a role in the formation of the metaphase plate, which becomes a rough projection in one plane of the relative positions occupied by chromosomes at prometaphase.

(3) Heterochromatic regions are for the most part those associated with the nuclear and nucleolar membranes. Chromatin in the condensed state tends to be associated with these membranes. In fact, chromatin at all its levels of integration seems to be associated with the surfaces of structures of which it forms a part.

We may now superimpose upon the above the following established facts and current assumptions:

(4) The chromosomes in the interphase of rapidly dividing cells maintain their telophase polarity. Even in longer interphases, where the chromosomes shift positions considerably, this polarity is never wholly lost.

(5) The nucleolus is typically borne on definite loci of definite chromosomes.

(6) The centromere, telomere, and nucleolus-organizing regions are usually heterochromatic. Conversely, the bulk of heterochromatin is located in these regions. Centromere and telomere concentrations are known as chromocenters.

(7) Centromeres and telomeres have many properties in common.

(8) These regions are sensitive to external conditions.

(9) They are frequently associated with concentrations of cytoplasmic bodies.

(10) In many plant cells (e.g. *Allium*) they reflect cell polarity. The larger, usually more numerous proximal chromocenters are on the nuclear membrane in the region of the active division pole, and the smaller, less numerous distal chromocenters are located at the opposite, less active pole.