addition of an essential constituent to an inadequate diet, it does so because cell reactions which could not proceed in the absence of the added factor are now made possible. We believe that as the growth syntheses occur, the demand for raw materials is reflected in a stimulation of the appetite resulting in greater food consumption. It is difficult to see why such a view is unreasonable, or necessitates great gullibility for its acceptance. Furthermore, if food intake is not influenced by the adequacy of the ration it is a remarkable coincidence that of our histidine- and arginine-fed rats not a single one inadvertently made the mistake of eating more or less food than the other members of its group.

Mitchell also criticises in a similar fashion several papers dealing with the possibility of replacing essential amino acids (cystine and histidine) with synthetic compounds. It is scarcely necessary to defend these papers, inasmuch as no experimental data have been adduced indicating that our findings are incorrect. Suffice it to say that we are still of the opinion that taurine is "totally incapable" of replacing cystine in the diet for purposes of growth,[8] nor do we know of any reason for abandoning the conclusions expressed in the original publications regarding the availability of synthetic imidazoles.[9]

Mitchell cites the work of Lewis and Root[10] upon the replacement of lysine by nor-leucine as an example of a properly conducted experiment, in which the alterations in food consumption inherent in our investigations do not occur. If one calculates the average daily food consumption of Lewis and Root's rats, as may be done readily from the information supplied in the paper, it becomes evident immediately that *the foods were not consumed in equal amounts.* On the contrary, as would be expected, the change from an inadequate (gliadin) to an adequate (gliadin plus lysine) diet *was followed invariably by an increase in average daily food consumption. Supplementing gliadin with nor-leucine led to no appreciable change in food intake because both rations were equally inadequate for growth.* Furthermore, it must not be forgotten that gliadin contains some lysine. Were it completely devoid of this amino acid, the addition of the latter would lead to even greater alterations in food consumption than those observed. The experiments of Lewis and Root are comparable to our taurine investigations, in which the basal diet was not completely devoid of cystine. The magnitude of the changes in food consumption is of the same order in the two studies. There can be no reasonable doubt of the correctness of Lewis and Root's conclusions regarding the inability of nor-leucine to replace lysine, but the implication of Mitchell that there were no alterations in food consumption with the different types of diets is not in accord with the facts.

[8] Rose, W. C., and Huddlestun, B. T., *J. Biol. Chem.*, 1926, lxix, 599.

[9] Cox, G. J., and Rose, W. C., *J. Biol. Chem.*, 1926, lxviii, 781.

[10] Lewis, H. B., and Root, L. E., *J. Biol. Chem.*, 1920, xliii, 79.

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THE SIBERIAN METEORITE

IN view of recent newspaper reports regarding a great meteorite supposed to have fallen in Siberia, I am sending you the following rather free translation of Mr. L. Kulik's story as it originally appeared in Russian.

From the two newspaper articles by Mr. L. Kulik, which you gave me, I have been able to obtain the following information concerning the so-called "Tungusk meteorite."

The appearance at 7 o'clock in the morning on June 30, 1908, of a "fiery body" of unusual brightness, rolling across the sky out of the north east and falling down in the "taiga" between the Yenissei and Lena Rivers, north of the Railroad line, was observed by a great number of people, mostly the native inhabitants, living in the basins of these rivers.

The fall of the meteorite was instantly followed by a column of fire rising skyward, by the formation of the heavy black clouds, and by a most deafening, resounding noise far surpassing in its magnitude, any thunderstorm, or artillery cannonade. This was heard for hundreds of kilometers within a radius of the cities of Yenisseisk, Krasnoyarsk, Kansk, Nijneudinsk, and Kirensk on Lena.

A terrific air-wave was formed which pushed ahead everything that it met in its way. The water in all rivers, lakes and streams was raised up; people and animals were lifted by it and carried along.

The vibrations produced by the fall of the meteorite were detected and registered by the seismographs of the Physical Observatory at Irkutsk, where Mr. A. V. Vesnesenski, who was in charge of the observatory, calculated the epicenter of the "earthquake" to be located in the upper part of the Podkamennaya Tunguska.

The phenomenon produced considerable panic, especially among the natives living in the basins of the Yenissei and all the various Tunguska Rivers, and adjacent part of the Lena River basin.

Several attempts, made in 1908, to find the body of the meteorite were fruitless, as for some reason all parties were searching near the city of Kansk, and not in the locality, determined by A. V. Vesnesenski, whose observations unfortunately remained unpublished. Gradually interest in the new meteorite died, and the whole matter was almost forgotten, except as a tale among the natives.

In 1927 Mr. L. Kulik attempted to find the exact location of the meteorite and led an expedition to the Tunguska region. Owing to the lack of funds and the extreme difficulties of transportation in the wilderness of taiga and tundra, the expedition was not altogether successful. However, Mr. Kulik was able to reach the area where the taiga bore distinct traces of the passage of the meteorite. An area struck by the meteorite is a water table between the upper part of the Podkamennaya Tunguska and its right tributary the River Chuni. The area is largely covered with tundra in the process of formation, intersected by hills, small lakes, swamps and typical tundra. The immediate area is surrounded by high naked hills, deforested by the falling meteorite. All trees are still on the ground, their tops are spread out in fan-like fashion away from the central zone of the fall. Exceptions are noted only in the ravines or in the gorges and deep perpendicular valleys and also in a zone which can be considered as the "interference" zone. And even in these places the trees, in most cases, are scorched and though still in upright position they are all leafless and dead.

The zone where the heat effect of the meteorite is evident is considered by L. Kulik to be 30 kilometers in diameter and the area of the air-wave breaking the trees is 50 kilometers in diameter.

The central part of the "fire zone" is covered by shallow "funnel" shaped craters, reaching in some instances many tens of meters in diameter and not greater than 4–5 meters in depth. The bottom of the craters is covered with swampy growth.

Unfortunately, Mr. Kulik was not able to find the body of the meteorite or determine the depth to which it had sunk.

He believes that the meteorite of 1908 was an aggregate (a swarm) of meteors, moving with a rate approaching 72 kilometers a minute. Some of the aggregates undoubtedly exceeded 130 tons in weight. Hot gases (above 1,000° C.) surrounded the meteorite and started fires before the meteorite had reached the ground and sunk into it, forming craters, uprooting the trees and burning everything that can burn in the center of its fall.

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CONCERNING A RHIZOCTONIA WHICH FORMS HYMENIAL CELLS AND BASIDIOSPORES IN CULTURE

WHILE investigating root-rot diseases of alfalfa in October, 1924, a Rhizoctonia was isolated from a mass of hymenial cells and basidiospores which occurred on one of the diseased alfalfa plants. Several weeks later this Rhizoctonia was observed to have produced its perfect stage in pure culture and has continued to form hymenial cells and basidiospores up to the present time, when grown on certain artificial media and under proper external conditions.

Numerous single-spore isolations have been made from individual basidia of the spore-forming Rhizoctonia and with very few exceptions, all have formed spores. While under constant observation through a microscope, complete sets of spores have been picked from basidia by means of a Barber micromanipulator. All of the spores that germinated and continued to grow formed the perfect stage similar to the original isolation. This Rhizoctonia, therefore, is considered to be homothallic.

The hyaline mycelium formed by this Rhizoctonia can not be mistaken for that formed by *R. crocorum* (Pers.) D.C., which also occurs on alfalfa, and it is not believed that the two fungi are genetically connected. Cultures of Rhizoctonia were received from plant pathologists in various parts of the United States and amongst these one was found which is believed to be similar to the spore-forming Rhizoctonia isolated in Michigan. The former culture was isolated in Minnesota from an alfalfa root, which apparently was not affected with the violet root-rot disease. When grown under similar conditions the Minnesota Rhizoctonia was found to have spores and other characters identical with that of the Michigan strain.

The spore-forming fungus under consideration differs in many ways from *Rhizoctonia solani* Kühn (*Corticium vagum* B. & C.). The mycelium of the former is characteristically hyaline and lacks the brown color associated with *R. solani*. The sclerotia are smaller and less numerous. These differences are especially pronounced when the two fungi are grown on potato dextrose agar. Differences in sterigma length and in spore size distinguish the perfect stages of these two Rhizoctonias.

The perfect stage of the new spore-forming Rhizoctonia is apparently to be considered as a *Corticium* which is characterized, both on artificial media and upon inoculated alfalfa plants, by the unusual length of sterigmata.

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MODELING CLAY AS A SUBSTITUTE FOR COLOPHONIUM WAX IN THE PHYSIOLOGICAL LABORATORY

IN the experience of the writer and of several associates the colophonium wax which has such a general use in the physiological laboratory has proven unsatisfactory in several ways. Plasteline modeling-clay has been found a satisfactory substitute and free from some of the faults of the wax. This is due to its more stable consistency. It does not require warming before use. Low temperatures do not cause