the medical school of the University of Pittsburgh; Dr. Winfield Scott Hall, professor of physiology, Northwestern University, and Dr. James C. Wilson, emeritus professor of the practise of medicine and of clinical medicine, Jefferson Medical College.

UNIVERSITY AND EDUCATIONAL NEWS

"GILMAN HALL" has been decided upon as the name of the first unit, now being built at a cost of $220,000, of the future group of permanent buildings for chemistry at the University of California. This name was chosen by the regents in honor of Daniel Coit Gilman, president of the University of California from 1872 to 1875, to whose initiative was due the organization of the college of chemistry of the university, and who in his later career as president of Johns Hopkins University did such notable service to the development of opportunities in the American universities for training for scientific research.

GOUCHER COLLEGE has announced the completion of a "Supplemental Endowment Fund" of $1,000,000, one fourth of which was conditionally subscribed by the General Education Board. Nearly half of the entire amount has already been paid in.

A BILL introduced into the Illinois legislature proposes expenditures for the medical department of the University of Illinois amounting to $2,000,000 during the next decade.

MRS. ALEXANDER F. MORRISON, formerly president of the National Association of Collegiate Alumnæ, has given $1,500 to the University of California for the purchase of an ophthalmological library of 486 volumes for the University of California medical school.

MRS. ROSCOE R. BELL, of Brooklyn, has given the valuable library on comparative and veterinary medicine belonging to the late Professor Roscoe R. Bell, to the Alexandre Liautard Library of New York University.

DR. ELLSWORTH HUNTINGTON, who resigned from Yale University several years ago to devote his entire time to research work, will become officially connected with the university again next year as a research associate in geography. Dr. Huntington will make his headquarters in New Haven and will give every year a course of lectures on his investigations, which cover a broad field that has to do particularly with the effect of climatic changes on the course of civilization.

THERE has been appointed at the Massachusetts Institute of Technology a committee of the faculty to consider ways of improving the methods of instruction and Dr. Charles R. Mann has been called to the institute to be chairman of the committee. Dr. Mann is professor of physics in the University of Chicago, but for the past two years has been on leave of absence to make a report on engineering education under the auspices of the Carnegie Foundation for the Advancement of Teaching.

DISCUSSION AND CORRESPONDENCE

MORE "MOTTLE-LEAF" DISCUSSION

IN a recent paper Briggs, Jensen and McLane[1] discuss the situation with regard to "mottle-leaf" in citrus trees based on certain observations which they have made on orchards located in southern California. The undersigned has read their statement with the greatest interest and desires in the friendly spirit of a scientific colleague to make some comments thereon by way of broadening the discussion.

1. In reviewing the causes which have been given in the past for the production of "mottle-leaf" conditions, the authors above named mention the theories of Smith and Smith[2] and of Thomas[3] but say nothing of that promulgated in 1914 by the undersigned[4] which still seems to me to be the most definite and reasonable hypothesis for explaining the conditions in question in citrus trees.

2. Briggs, Jensen and McLane have pointed out that about half of the "mottling" is associated with soil conditions in which humus is

[1] *Jour. Agr. Res.*, Vol. 6, No. 19, p. 721, August, 1916.

[2] *Calif. Agr. Expt. Sta. Bull.*, No. 218, pp. 1139–1911.

[3] *Calif. Agr. Expt. Sta. Circ.*, 85, 1913.

[4] SCIENCE, N. S., Vol. 39, No. 1011, p. 728, May, 1914.

deficient, but this, it seems to me, gives no justification for the following statement, which I quote from their paper:

An impartial statistical study of the data from the individual orange groves shows that approximately one half the mottling *can be accounted*[5] *for* by the low humus content of the soil.

3. That all or nearly all citrus soils in southern California are deficient in organic matter has long been known. But to state that half of the mottling "can be accounted for" by deficiencies of the soil in humus when the other half of the mottling is not at all accounted for seems to me to be an unusual procedure.

4. Moreover, the method employed by Briggs, Jensen and McLane for determining humus, upon which much of their discussion depends, has already been pointed out by Gortner[6] to be insecure if not entirely inaccurate. In the writer's laboratory it has also been found that intensity of color is no criterion of the amount of humus. Moreover, no one has yet proved, and there is no justification for believing that the humus portion of the soil organic matter, as determined by any of the arbitrary methods in vogue, is of any greater value to plants or to soils than the rest of the soil organic matter.

5. That as the paper under discussion points out the total nitrogen content of soils is not related to the amount of mottling should be no cause for surprise since it is the amount of "available" nitrogen as the writer has on many occasions pointed out rather than the amount of total nitrogen that should reasonably be assumed to affect plant growth. This is especially true under arid soil conditions, in which, moreover, the term "available" possesses more than the usual significance.

6. It seems to the writer that we need a theory or theories on some definite and specific cause of "mottle-leaf" in citrus trees and not a description of some general condition like a deficiency of organic matter which can affect soils in many different ways, not always in the same direction, and which besides is universally recognized to constitute the most undesirable feature of arid soils.

7. As Briggs, Jensen and McLane point out, however, something which affects chlorophyll formation in the leaves of the citrus tree is responsible for the trouble. That factor, in my opinion, is a lack of usable nitrogen, and in view of the peculiar mineral conditions of our soils, it may in many instances also be due to a lack of usable iron.

8. The writer does not wish to be understood as denying the effectiveness of a lack or of a sufficiency of organic matter in the production or eradication, respectively, of mottle-leaf in citrus trees. He does desire, however, to deny that there is anything specific about the organic matter factor, since it can affect plants in one of so many different ways; that the portion of the soil organic matter known as humus is any criterion as to the activity and value of the soil organic matter; that the "mottling of orange trees has been definitely correlated with the low humus content of the soil per se; and that soluble organic matter placed in the zone of the feeding roots promises any better for the eradication of "mottle-leaf" than the practise of green manuring which, to put it mildly, has thus far fallen far short of the expectations originally entertained for it.

9. As I have pointed out in the papers above cited, we shall probably be compelled not only to supply sufficient available nitrogen to eradicate the physiological troubles of our citrus and other crops, but we shall have to make it usable by some method of soil protection which will make it possible for roots of plants to make use of the surface soil. The most promising method of soil protection now seems to be complete straw mulching.

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[5] Italics mine.

[6] "Soil Science," Vol. 2, No. 5, p. 395, November, 1916.

LORD LISTER ON THE VALUE OF VIVISECTION

TO THE EDITOR OF SCIENCE: The enclosed rough draft of a letter to "Dr. Keen" (as the envelope was endorsed) was found among the late Lord Lister's papers by his nephew and