considers that the attention of the government and of municipalities should be called to the possibility of reducing the evil by increasing the tax on dogs and by enforcing by-laws. The committee considers that in towns the tax on one dog should be doubled and a large progressive increase imposed on each additional dog.

THE Henry S. Upson Foundation has been organized in Philadelphia for the purpose of encouraging the systematic study of problems wherein dental pathologic conditions are correlated with those of internal medicine, surgery, neurology and psychiatry. The late Henry S. Upson, professor of neurology in the Western Reserve University, had been for years deeply interested in the subject, and the foundation has been endowed by Mrs. Upson as a memorial to her husband. The organization is composed of a commission, the members consisting of Drs. Edward C. Kirk, chairman, J. Madison Taylor, Charles E. deM. Sajous, Nathaniel Gildersleeve, Hermann Prinz and Arthur Hopewell-Smith. This commission elected an executive committee consisting of three members of the commission—namely, Dr. Edward C. Kirk, chairman, Dr. J. Madison Taylor, secretary, and Dr. Nathaniel Gildersleeve. This committee selected a board of associate experts in lines which include the more cognate subjects, consisting of Dr. De Forrest P. Willard, orthopedist; Dr. Wendell Reber, ophthalmologist; Dr. Morris Piersol, internist; Dr. Charles R. Turner, prosthetist; Dr. M. H. Cryer, oral surgeon; Dr. John V. Mershon, orthodontist; Dr. S. D. W. Ludlum, neurologist; Dr. Ralph Butler, rhinologist and laryngologist, and Dr. Edward Schuman, pediatrist.

UNIVERSITY AND EDUCATIONAL NEWS

THE vocational-educational bill, providing for federal cooperation with the states in promoting agricultural and industrial education, makes an annual appropriation beginning at $500,000 and increasing each year by $250,000 until $3,000,000 is reached, to be apportioned to the states in proportion to their rural population.

THE trustees of the University of Indiana have recommended that a new medical school building, power house, laundry and nurses' home be erected on the grounds of the Robert W. Long Hospital, Indianapolis. A committee was appointed, including the president of the university, Drs. Samuel Smith, Richmond; Charles P. Emerson, John H. Oliver and Frank F. Hutchins, Indianapolis, to formulate plans for the proposed building and report to the board.

LORD CREWE at a meeting of the governing body of the Imperial College of Science and Technology, speaking, on June 30, of the professor's memorial on the neglected teaching of science, said that the government intended to appoint a committee of scientific men to inquire into the position of natural science in the English educational system, especially in the universities and secondary schools.

DISCUSSION AND CORRESPONDENCE

MOSQUITOES AND MAN

IN SCIENCE for June 2, 1916, p. 784, Dr. C. S. Ludlow calls attention to the association with man of those species of mosquitoes concerned in disease transmission, laying particular stress upon *Anopheles* and malaria. This is an important factor in epidemiology all too frequently overlooked by the sanitarian, but it is surprising to find that Dr. Ludlow claims for Major P. M. Ashburn, as indeed he does for himself, the discovery of this relation.

The fact is, this relationship has been long recognized by careful students. Its consideration unquestionably led Finlay to his deduction as to the transmission of yellow fever, the truth of which was afterward so thoroughly demonstrated by the American Army Commission.

In the case of malaria, Grassi was led to the discovery of the Anopheline host by similar considerations. He attacked the problem from the ecological viewpoint, eliminating those blood-sucking forms which did not coincide with the disease in distribution. This is really only a different formulation of the same idea.

India has probably produced a larger num-

ber of careful investigators of malaria and *Anopheles* than any other region. The fact that certain species of *Anopheles* occurred only in proximity to man, while others were "wild" was appreciated as early as 1902 and 1903 and it is set forth in the classic "Monograph of the *Anopheles* mosquitoes of India," by James and Liston (1904). A single brief quotation from Stephens and Christophers will be sufficient to demonstrate this.

Anopheles rossii was found by us always near human dwellings, and often in very foul water. In spite of this commonness of the species, larvæ were never found more than a stone's throw from dwellings. If in any place larvæ were discovered at a greater distance, they invariably turned out to be the larvæ of other species. *A. rossii* appears, then, in Bengal to be "foveal" in its distribution, in contradistinction to other species of *Anopheles* to be described.[1]

This difference in habits of the different species of *Anopheles* is generally recognized among workers in India, and one finds frequent allusions to it in their writings.

In Africa, a similar tendency on the part of certain species of *Anopheles* to associate with man has been noted and a number of authors could be cited in demonstration.

In America, the interrelation, at least in connection with malaria, seems to have been recognized rather tardily. Knab enunciated and discussed it in a series of papers published during 1912 and 1913 (1, 2, 3, 4, 5).

His deductions were based, he asserts, upon observations made by the writer in the Panama Canal Zone. The adaptation was indicated very clearly in discussing *Anopheles albimanus,* precisely the species, it is interesting to note, which also impressed Major Ashburn. I quote from the original statement.

While not domestic in the same sense as *Stegomyia calopus, Anopheles albimanus* is closely associated with man and finds its most congenial surroundings about his habitations and in the conditions he creates in the course of agricultural, engineering and other work. This fact is correlated with the highly developed blood-sucking habit and has been an active factor in its development and in establishing the economic importance of the species (6).

[1] Reports to the Malaria Committee of the Royal Society, London, 6th Series, p. 15, 1902.

The same relation of *Anopheles albimanus* toward man was observed by another worker in the Panama Canal Zone, James Zetek, and discussed in a paper published in 1915.

Quoting briefly:

The writer in his inspection of the Canal Zone, found *A. albimanus* to breed only near settlements. It therefore seems quite plausible to believe that the pathogenic species of *Anopheles* become more and more restricted to human settlements, an adaptation which no doubt will hold for all animals which play a rôle similar to that of *albimanus* in the transmission of disease (10).

But too sweeping claims regarding the adaptation of the malaria-transmitting *Anopheles* should not be made. The writer, as quoted above, has already indicated that the association with man is a much looser one than in the case of *Ædes calopus,* and, it should be added, *Culex quinquefasciatus* (*fatigans*). Knab points out that the long period during which the malarial gametes are present in the human circulation effectively compensates for less frequent opportunity for infection of the mosquito. Dr. Adolph Lutz of Brazil even goes so far as to condemn altogether the idea of adaptation in the case of *Anopheles* (7, 8).

He asserts that in Brazil, *Anopheles albimanus* occurs in uninhabited localities. Nor will he admit any predilection for man on the part of this mosquito, since he has observed that it prefers the horse to the rider (l. c.). In fact, no such predilection has been demonstrated for any *Anopheles,* except, perhaps, it can be inferred in the case of the Indian *Anopheles rossii.* That it does not exist in the European *Anopheles maculipennis,* which unquestionably has had all possible opportunity to develop such a taste, has been very clearly shown by Mühlens (9). Grassi and others have gone on record that the degree of attraction depends upon the size of the animal, a man being preferred to a dog, a horse or cow to a man.

This much must be admitted in any case; that the highly developed appetite for blood of certain species of *Anopheles* and frequent op-

portunities to satisfy that appetite from the same host, man, has made the malarial relation possible.

The important malaria transmitters are to be found among the most bloodthirsty species, and such species will mutiply rapidly in the presence of an abundant food-supply, as when laborers are massed at some previously uninhabited point. That there will be a corresponding decrease in these *Anopheles* when the food-supply is removed goes without saying.

Returning to the conditions in India, it is interesting to note that the most "domestic" species of *Anopheles rossii,* already indicated in the foregoing, is not a malaria transmitter. The most important transmitters are species normally breeding at a distance from human habitations and showing no special "domesticity." They have, however, a very highly developed appetite for blood, and this, in spite of their very much smaller numbers, makes them most effective transmitters of the malarial parasites.

1. (1912, April 27.) Knab, F., Unconsidered Factors in Disease Transmission by Blood-sucking Insects. *Jour. Econ. Ent.*, Vol. 5, pp. 196–200.
2. (1912.) Knab, F., [Dependence of Disease Transmission by Blood-sucking Insects upon Habits]. *Proc. Ent. Wash.*, Vol. 14, pp. 79–81.
3. (1913, Jan. 13.) Knab, F., Blood-sucking Insects as Transmitters of Human Disease. *Proc. Ent. Soc. Wash.*, Vol. 14, pp. 219–221.
4. (1913, July.) Knab, F., The Species of *Anopheles* that Transmit Human Malaria. *Amer. Jour. Trop. Dis. and Prev. Med.*, Vol. 1, pp. 33–43, 277.
5. (1913, Oct. 3.) Knab, F., The Contentions regarding "Forest Malaria." *Proc. Ent. Wash.*, Vol. 15, pp. 110–114.
6. (1912.) Jennings, Allan H., Some Problems of Mosquito Control in the Tropics. *Jour. Econ. Ent.*, Vol. 5, pp. 131–141.
7. (1913.) Lutz, A., The Insect Host of Forest Malaria. *Proc. Ent. Soc. Wash.*, Vol. 15, pp. 108–109.
8. (1913.) Lutz, A., Forest Malaria. *Proc. Ent. Wash.*, Vol. 15, pp. 169–170.
9. (1908.) Mühlens, P., Ueber einheimische Malariaerkrankungen in der Umgegend von Wilhelmshaven und ihre Bekämpfung. *Arch. f. Schiffs- u. Tropen-Hyg.*, Bd. 5, pp. 58–70; Malariabekämpfung in Wilhelmshaven und Umgegend. ii. *Arch. f. Schiffs- u. Tropen-Hyg.*, 1909, Beiheft 6, pp. 166–173.
10. (1915.) Zetek, James, Behavior of *Anopheles albimanus* Wied. and *tarsimaculata* Goeldi. *Ann. Ent. Soc. Amer.*, Vol. 3, pp. 221–271.

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GOITER AMONG THE INDIANS ALONG THE MISSOURI

THE writer would like to call the attention of those interested to the excessive prevalence of goiter and symptoms of thyroid derangement among the Indians along that part of the Missouri Valley comprised between the Cannon Ball Creek and Cheyenne River, in North and South Dakota. The prevalence and relative acuteness of these conditions are such as to demand some special steps for their control or relief, and invite a thorough local investigation of conditions by specialists or institutions.

The people in question are the Cheyenne River and Fort Yates Sioux, and were visited by the writer last April. The frequency of goiter among the Cheyenne River bands ("Blackfeet" and "Two-Kettle") has been known for many years. In 1908, on the occasion of the writer's report on various diseases among the Indians,[1] they were in that respect at the head of the column, with 61.4 cases of goiter per thousand population, compared to 3 per thousand for the U. S. Indians as a whole. But the present extent and the equally great or even greater frequency of the disease in certain parts of the Fort Yates territory have not been suspected.

The writer examined in the two localities mentioned between 400 and 500 children and adults. The examinations were for anthropological purposes, and no record was kept of the exact proportion of thyroid enlargements; but the subject soon forced itself upon his attention. Case after case was met, particularly

[1] Hrdlička, Aleš, "Physical and Medical Observations among the Indians of Southwestern U. S. and Northern Mexico," p. 201.