assistant chief, Bureau of Highways and Street Cleaning, Philadelphia.

Read by title.

The Mixing Plants Used in the Construction of the Topeka Bituminous Concrete Pavements of the Borough of Queens in 1912: A. F. GRUENTHAL, assistant engineer, Bureau of Highways, Borough of Queens, N. Y.

Read by title.

Bituminous Gravel Concrete Pavements: SPENCER J. STEWART, division engineer, New York State Department of Highways, White Plains, N. Y.

This pavement consists of mixing Hudson River cementatious gravel, heated to a temperature of over 225 degrees F., with natural lake asphalt heated to a temperature of not less than 275 degrees F., then placing both ingredients in a mechanical revolving mixer and thoroughly agitating until all the particles of the mineral aggregate are thoroughly and completely coated with the bituminous material.

This mixture, at not less than 250 degrees F., is then spread upon the prepared bottom or foundation course.

The gravel is composed of calcareous sandstone, granite and quartzite, associated with a considerable amount of finer particles of the above-named rocks, together with a percentage of clay. This latter substance gives the gravel a good cementatious value, which is an essential to the comparative permanency of the pavement. The clay acts as a catalyzer on the asphalt, making it more viscous, less volatile and also less brittle.

The advantages of this pavement are:

First, its comparatively low cost over so-called semi-permanent pavements.

Second, on account of its adaptability to country and parkway purposes, due to its easy riding surface and its conformity to our ideals of the surroundings of a parkway or country highway.

Third, on account of its non-slippery nature, it being practically a "non-skid" road.

From the contractor's bids, the average cost of this pavement is about $0.85 per square yard.

A Review of the Use of Bituminous Materials in the Construction and Maintenance of American Highways during 1912: ARTHUR H. BLANCHARD, professor of highway engineering, Columbia University, New York City.

G. W. BISSELL,
Secretary

EAST LANSING, MICH.,
March 10, 1913

SOCIETIES AND ACADEMIES

THE HELMINTHOLOGICAL SOCIETY OF WASHINGTON

THE fifteenth regular meeting of the society was held at the residence of Dr. Ransom, March 20, 1913, Dr. Ransom acting as host and Mr. Chambers as chairman.

The comparative anatomy of the free-living and the parasitic nematodes was discussed by the society.

Mr. Crawley presented a note reviewing Muriel Robertson's work on *Trypanosoma gambiense* and its vector, *Glossina palpalis*. She has shown there is a rhythmic cycle in the life of the trypanosome in the vertebrate host, the parasite falling off in numbers at times until there are only a few small forms present, which then begin to multiply with a resultant production of larger forms until the blood contains numerous large forms, and the cycle repeats. An endeavor to correlate this alternation of few small forms and numerous large forms with the infectivity of the trypanosomes for its invertebrate host, the tsetse fly, developed the fact that the infectivity was at its maximum when the few small trypanosomes were in the blood and at its minimum when the many large forms were present.

Dr. Ransom presented a note on "The Reported Hosts of *Cysticercus cellulosæ*." It is commonly stated in general works on parasitology that *Cysticercus cellulosæ* occurs not only in the pig, its usual host, and in man, a not uncommon host as a result of auto-infection, but also in the dog, cat, bear, sheep, deer, rat and monkeys. It has also been reported from a seal.

The only hosts, however, in which the occurrence of *Cysticercus cellulosæ* can be considered to have been proved are the first three named. The reputed occurrence of *C. cellulosæ* in the cat, bear, rat and seal rests apparently upon a single instance of the discovery of cysticerci resembling *C. cellulosæ* in these hosts without proof by feeding experiments. Likewise, though several cases of *C. cellulosæ* have been reported from monkeys and rather many cases from sheep and deer, no experimental proof or other evidence of a conclusive nature that the parasites in question were really *C. cellulosæ* has been furnished. On the contrary, the evidence thus far available tends to prove the non-occurrence of *C. cellulosæ* in these animals, particularly in the case of sheep and deer. It has, in fact, been recently shown (Ransom, 1913) that the muscle cysticercus of sheep

resembling *C. cellulosæ* is the intermediate stage of a dog tapeworm; consequently very definite and detailed evidence must be produced before any case of cysticercus in sheep can be accepted as a case of *C. cellulosæ*. Similarly, more definite evidence than has been furnished in the various reported cases of muscle cysticerci in deer will be required before any such can be accepted as a case of *C. cellulosæ*. Though it is perhaps not surprising that the muscle cysticerci of sheep should have been accepted as *C. cellulosæ* in view of the fact that sheep commonly live in rather close relationship with human beings, it does seem, on the other hand, surprising that the reports of cases of *C. cellulosæ* in deer should not have been questioned heretofore. Furthermore, it would seem, in view of the fact that it has long since been shown (Moniez, 1879) that the cysticerci in reindeer somewhat resembling *C. cellulosæ* are the larvæ of a dog tapeworm, that observers of cysticerci in other deer would have hesitated to identify them as *C. cellulosæ*, yet no one appears to have doubted the correctness of such an identification. Even in certain cases in which it was noticed that the hooks did not correspond perfectly to those of *C. cellulosæ* the observer nevertheless concluded that the parasites were actually *C. cellulosæ*. The history of *C. cellulosæ* emphasizes the necessity of guarding against the indiscriminate acceptance of host records. As a general rule records of the same species of larval tapeworm from a variety of hosts should be considered of doubtful correctness unless supported by feeding experiments or other conclusive evidence.

MAURICE C. HALL,
Secretary

THE ANTHROPOLOGICAL SOCIETY OF WASHINGTON

A SPECIAL meeting of the society was held at 4:30 P.M. on March 25, 1913, in room 43 of the new building of the National Museum, the president, Mr. Stetson, in the chair.

Dr. George Grant MacCurdy read a comprehensive paper on "Ancient Man, His Environment and Art."

This paper dealt with the environmental factor in human development; the newly discovered human remains from Piltdown, Sussex, and their significance; recent finds in the terraces of the Somme Valley; San Isidro, near Madrid; Torralba, a large camp site in the province of Soria, Spain, where a rude stone industry associated with an ancient fauna has been found; caves on the Island of Jersey occupied by Mousterian man; typical caves and rock shelters of southern France: La Quina, La Ferrassie, Placard; the art of the cave man in France and Spain: Altamira, Castillo, La Pasiega, Covalanas, Pindal, Font-de-Gaume, Cap Blanc, Niaux, Gorgas, Laussel, Alpera, Cogul; representations of the human form; La Combe, a cave in the Dordogne excavated last summer by Professor MacCurdy; Tuc d'Audoubert, a Pyrenean paleolithic cavern of great beauty discovered last July; its parietal art and the unique figures of the bison modeled in clay; paleolithic art in its relation to magic; some of the causes which led to its development and eventually to its decay.

The lecture is based largely on first-hand observations by the lecturer during the past summer. The lantern slides reproduce faithfully in color the remarkable paleolithic cavern frescoes. The epochs covered by the lecture beginning with the oldest are: Eolithic or pre-Chellean, Chellean, Acheulian, Mousterian, Aurignacian, Solutrean, Magdalenian and Azilian. These are all pre-Neolithic.

Several questions were asked and answered.

W. H. BABCOCK

THE CLEMSON COLLEGE SCIENCE CLUB

THE regular monthly meeting of the club was held on Wednesday evening, January 15. The first paper was by Dr. R. N. Brackett, head of the department of chemistry, entitled "The History of the Clemson College Science Club." There was a great deal in this that was very interesting, as Dr. Brackett presented same in a very entertaining manner and pointed out that the club had entertained and had before it some distinguished men in its history.

The next paper of the evening was by Professor J. N. Harper, director of the agricultural department and of the South Carolina Experiment Station, on the "Mendelian Law." This was treated from the standpoint of his own experiments and observations on this law. He very lucidly gave the history of Mendel and the explanation offered by him for the operation of his law. It is of decided interest also that Professor Harper has done original work along this line and has evolved an explanation for the working of the law that has invariably been borne out in his observations and experiments.

F. R. SWEENY,
Secretary