movement upwards of huge masses of rock salt in Cenozoic deposits along the Gulf border. The bearing of the structures produced in the neighboring beds by such growths and movements on oil concentration was duly set forth in Bulletin 429 of the United States Geological Survey. Recently he has had the opportunity of testing the value of his "dome theory" for locating oil "pools" in a region far away from any known oil occurrences. Reference is here made to Pine Prairie, south central Louisiana, where the Myles Mineral Co. has had the courage to try out the theory and has discovered by the means a new oil field. The director writes "I consider this a most remarkable vindication of a theory originated by you, and we attribute a large measure of our success thus far to your advice."

Space should not be taken here to discuss the probable exact location of oil in connection with these domes; that is a matter depending largely on the approach of the salt dome to the surface, size, location, etc. These matters have been outlined at least in the U. S. Geological Survey Bulletin already referred to. But the location of oil by means of a theory unheard of ten years ago does seem worthy of record at this time. Another fact that should be impressed upon the mind of the public now is the absolute worthlessness of stock in companies putting down wells "near" the discovery well. This matter has, however, been discussed in Bulletin 429.

G. D. HARRIS

CORNELL UNIVERSITY

THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE SECTION D

DR. J. A. HOLMES, director of the Bureau of Mines, was elected vice-president of the association and chairman of Section D for the next meeting, at Cleveland. Professor O. P. Hood was elected a member of the council for the Cleveland meeting and Major W. W. Crosby a member of the sectional committee for five years, *vice* Professor J. E. Boyd, whose term expired. Mr. W. Bowie represented the section in the general committee.

The meetings of the section were presided over by Vice-president C. S. Howe, of Cleveland. The section held its first session on Wednesday morning, December 27, at Georgetown Law School. Two sessions were held on Thursday at the same place. On Friday morning and afternoon the section met in the Institute for Industrial Research. On Saturday, visits of inspection, under the direction of Professor A. H. Blanchard, were made to the office of good roads and to the sites of actual road construction in the vicinity of Washington and Baltimore.

On Thursday afternoon, following the address of retiring Vice-president A. L. Rotch, the following resolutions were adopted:

WHEREAS, the new and important art of navigating the air requires for its proper development exclusive investigations in aerodynamics, and thorough comparative tests of practical aerial machines, and

WHEREAS, the Aero Club of America proposes to secure the endowment of a laboratory for such investigations and comparative tests, therefore be it

Resolved, That the Engineering Section of the American Association for the Advancement of Science expresses to the Aero Club of America its appreciation of the urgent need for such a laboratory, and heartily commends its efforts to secure an adequate endowment, and be it further

Resolved, That a copy of these resolutions be sent to the Aero Club of America, with best wishes for the success of its efforts.

On Friday afternoon, resolutions were adopted extending the thanks and appreciation of the section to Dr. A. S. Cushman, director of the Institute for Industrial Research, for the use of the laboratory for the meetings on that day. The secretary takes this occasion to express his appreciation of the valuable assistance of Dr. C. S. Howe and Professor A. H. Blanchard in securing papers for the program and to the members and non-members who contributed.

The Washington meeting of Section D was successful beyond expectations, the papers being valuable and interesting and the attendance at the sessions encouraging as to numbers and interest manifested.

Abstracts and titles are listed below by groups.

MISCELLANEOUS PAPERS AND TITLES

Analysis of the Deflections and Stresses in Reinforced Concrete Floor Slabs Constructed on

the Turner Mushroom System: H. T. Eddy, University of Minnesota.

Owing to the apparently irregular distribution of the reinforcement employed in this system and to the uncertainty as to the value of Poisson's ratio or lateral contraction for reinforced concrete, engineers have differed widely in their estimates of the strength and stiffness of this form of construction, and have distrusted the results of tests made to determine deflections. The author has in this paper given a complete rational analysis of this form of construction and derived simplified but closely approximate practical formulæ for the resistance and deflection of this slab, showing how the various constants depend upon the properties of the materials composing the slab and how their arrangement affects its strength and rigidity. Of these several constants Poisson's ratio is the most important. It is shown in the paper that the value of Poisson's ratio obtained from experiments upon ordinary test specimens of square or round cross section is necessarily much too small for material circumstanced as is the reinforcement in a slab. The experimental results obtained from the deflection of mushroom slabs makes it probable that the proper value of Poisson's ratio for the reinforcement is nearly twice that obtained from ordinary test specimens. On this basis the theoretical results arrived at in the paper agree in a very striking and remarkable manner with the empirical formulæ which have been proposed to express the results of the numerous tests heretofore made on such slabs.

The Primary Triangulation System of the United States; its Extent and Uses: William Bowie, U. S. Coast and Geodetic Survey.

This paper shows that extended areas can not be accurately controlled by a number of disconnected local trigonometric surveys, owing to the deflection of the vertical (or the station error) at the astronomic stations which control the positions of the several schemes of triangulation. The primary triangulation, on the other hand, is continuous and no discrepancies will be shown between detailed surveys based upon it. The positions of objects shown on maps, charts and surveys based on the U. S. Standard datum will probably never be changed. Examples are cited of the use of trigonometric surveys by the United States and Canada Boundary Survey, by the state of Maryland in its oyster survey, by the Isthmian Canal Commission, by the city of New York and by the Clinchfield Coal Corporation in Tennessee. It is planned to extend the primary triangulation into new areas as readily as possible, and it is hoped that, eventually, no place in the United States will be more than 150 miles from some primary station.

Curved Line Vernier Method: H. E. Wetherill, Philadelphia. Read by title.

Differentiation of Saturated Vapor Engines: J. E. Siebel, Chicago. Read by title.

PAPERS ON THE WORK OF THE BUREAU OF MINES

In Relation to Gas Producers and Internal Combustion Engines: R. H. Fernald, Case School of Applied Science.

The investigations show that practically every shipment of fuel tested in the gas producers, including coals as high as 44 per cent. ash, and lignites and peats high in moisture, has been successfully converted into producer gas which has been used in operating gas engines. It has been estimated that on an average there was developed from each coal tested in the gas producer plant two and a half times the power developed when used in the ordinary steam-boiler plant, and that such relative efficiencies will probably hold good for the average plant of moderate power capacity, though this ratio may be reduced in large steam plants of the most modern type. It was found that the low-grade lignite of North Dakota developed as much power when converted into producer gas as did the best West Virginia bituminous coals when utilized under the steam boiler; and in this way lignite beds underlying from 20,000,000 to 30,000,000 acres of public lands, supposed to have little or no commercial value, through these investigations have been shown to have a large value for power development and the money value of the government's own property has been increased to the extent of probably $300,000,000 or more. The investigations into the waste of coal in mining have shown the enormous extent of this waste, aggregating from probably 200,000,000 to 300,000,000 tons yearly, of which at least one half might be saved. It is being demonstrated that the low-grade coals high in sulphur and ash now being left underground can be used economically in the gas producer for power and light and should, therefore, be mined at the same time that the high-grade coal is being removed. The use of these low-grade fuels, which have previously been regarded as of little or no value, increases our fuel resources approximately (on the basis of present marketable grades): low-grade bituminous and anthracite, 75–100 per cent.; sub-bituminous, lig-

nite and peat, 60 per cent; or roughly, total increase of 150 per cent. over our present supply of marketable grades of fuel. The logical conclusion from a careful study of the producer gas power situation is that the time is not distant when financial interests in power production will be directed toward the centralization of the producer-gas power plant at the mines and the distribution of the energy developed either by high-voltage long-distance electrical transmission or by pipe systems for conveying the gas.

Investigations in Relation to Fuels and Fuel Efficiencies: O. P. HOOD and S. B. FLAGG, Bureau of Mines.

The Bureau of Mines is engaged in investigating the general problem of the conservation of our mineral fuels by careful study of the problems of preventing waste in mining transportation and storage and of increasing the efficiency with which the fuel is finally used for heat, power, etc., and also the problem of utilization of inferior fuels not now generally used, owing to ignorance as to their value and the means of making that value available. The study of the problem of combustion for steam and for gas engines was inaugurated on a large scale in 1904, and is still in progress. At present the combustion of fuel for steam purposes is being examined in a specially constructed furnace permitting of the determination of temperatures and chemical composition at short intervals between the fire and the stack, and the values of refuse collecting at mines and in yards, and of lignite, peat and miscellaneous wastes from various industries, as fuels for the producer gas engine are being carefully investigated. Also the advantages of briquetting for rapidly deteriorating fuels, the best methods of transportation and storage, the prevention of mine explosions, spontaneous combustion and smoke are receiving careful attention. The purchase of fuel on the basis of specifications covering heat value and composition with penalty and premium provisions has been materially advanced by the bureau. The investigations of the bureau have been favorably received and the results in application by fuel producers and users have been gratifying and encouraging to further work.

With Special Relation to Safety in Mining, Quarrying and Metallurgical Operations: J. A. HOLMES, Director, Bureau of Mines.

The main purpose of the bureau is to increase health and safety in the mineral industries. It is endeavoring to collect statistics relating to accidents and health conditions in and about mines, quarries and metallurgical plants, and is investigating the causes of accidents and the conditions inimical to health and safety. One of the most important investigations is that of the cause of mine explosions, which involves a study of mine gases and coal dust and the conditions under which inflammable gases and dusts may be ignited. A related investigation, that of explosives used in coal mining, was undertaken to determine what explosives are least likely to ignite gases or coal dust. Another investigation deals with the prevention of accidents from electrical equipment in mines. The miscellaneous accidents in mines, including falls of roof, are also being investigated. These miscellaneous accidents, though individually small, each year kill more miners than the great explosions. The mine-rescue and first-aid work of the bureau has attracted more attention than its investigations. The bureau now has six mine-rescue stations and seven mine-rescue or mine-safety cars in the more important coal fields of the country. The work of these stations and cars is largely educational, training miners in mine-rescue and first-aid methods and demonstrating equipment and appliances. More cars and more equipment are needed. It is expected that within a few years the bureau will have trained 20,000 miners, who will be organized into local mine-rescue and first-aid corps, to be supported without aid from the federal government. The success of the bureau's work in behalf of safety will depend on how far this work receives the cooperation of mine owners and miners. The federal government can conduct investigations, the states can embody the results of these investigations in laws, but the cooperation of mine owner and miner are essential to success. The progress in lessening accidents is slow and there is serious need for extending the work of the bureau. Its investigations hitherto largely confined to the health and safety problems about coal mines, should cover similar problems at metal mines, quarries and metallurgical plants.

PAPERS ON AERONAUTICS AND AERIAL ENGINEERING

Holes in the Air: W. J. HUMPHREYS, U. S. Weather Bureau.

Aeronauts have adopted the picturesque phrase, "holes in the air," to describe that condition of the atmosphere that makes uniform horizontal flight impossible, and causes great danger to the aviator. Among the atmospheric conditions that may cause a greater or less drop of the aeroplane

are (*a*) horizontal strata moving with different velocities, (*b*) columns of air with different vertical components. The boundary between such strata and columns often is quite narrow, and hence the aviator may pass with disconcerting abruptness from one to the other. On certain conditions the downward acceleration may be even in excess of that due to gravitation and thus the aviator thrown out of his seat.

Aeronautical Screw Propellers: Spencer Heath, Washington.

The author discussed the propeller as a transmitter of power, the losses of efficiency due to slip and skin friction. He explained the design of the propeller on the principle that each section is an aerofoil traversing a helical path and deduced the formulæ for slip, pitch, thrust, speed and lost power, with applications to two specific cases. The paper was illustrated with numerous diagrams and full-size propeller blades.

Revolving Cylinder Aerial Motor: Emil Berliner, Washington.

Under this title, the speaker described the principle of design and construction of a new type of gasoline engine for propelling aircraft. This is made in two sizes and so designed and built as to give considerable power and good running balance.

Work of the Signal Corps in Aeronautics: G. O. Squier, Signal Corps, U. S. A.

The speaker gave a description of the work which has been done by the signal corps of the U. S. Army in the study of the prospects of the aeroplane for reconnaisance and dispatch work. A training school for members of the signal corps is established and a number of recruits are enrolled.

Endowment, Organization and Equipment of Aerodynamic Laboratories: A. F. Zahm, Washington.

Definition, functions, scope of aeronautic and aerodynamic laboratories. Bearing on the development of aeronautic science, art and industry. Endowment, organization and equipment of the Institut Aerodynamic de Koutchino, of the Aerodynamical Laboratory of the University of Göttingen, the Institute Perotechnique de St. Cyr, Eiffel's Aerodynamic Laboratory, etc. Methods of experimentation and results obtained in various laboratories. Aero Club of America's movement to secure the endowment of a national aeronautic laboratory.

Aerial Engineering: A. Lawrence Rotch, Blue Hill Observatory.

Vice-presidential address, published *verbatim* in Science, January 12, 1912.

PAPERS ON ROAD AND HIGHWAY ENGINEERING

History of Washington Bituminous Concrete Pavements: Martin Brooke, Washington.

Bituminous concrete pavement was first laid in Washington in 1871, since which date over a million square yards have been laid. Eight hundred thousand square yards are still in existence, less than two hundred thousand yards of which are in the original form. Between 1871 and 1878 half a dozen different types of patented bituminous concrete pavements were laid, a considerable portion of which were unsatisfactory and required resurfacing within a few years. The best of them, however, were fairly durable and economical, and some have continued in use to this day. These pavements were characterized by their thickness and density and by the quality and amount of the tar and tar-asphalt binder used. Bituminous concrete was abandoned in 1878 for sheet asphalt on hydraulic cement base, until 1888, when the inability to obtain bids for the latter type within the legal limit of two dollars per square yard set by Congress compelled the reintroduction of bituminous concrete. The pavements of this character laid between 1888 and 1893 under District of Columbia specifications were cheaper pavements than the old type, and the tar distillate binder used was decidedly inferior to the old tar. Since 1909, a bituminous macadam has been laid in suburban streets, which is very similar to the bituminous concrete pavement laid in the seventies.

History of Tar Concrete Pavements in Ontario: W. A. McLean, Toronto.

The first tar-concrete pavement in Ontario (Canada) was laid in Hamilton in 1880, a part of which is still in use. During the years 1889–1906 numerous tar-macadam pavements were laid in seven cities of the province, aggregating about 25 miles. Except in the city of Guelph, the use of commercial coal tar has been displaced by refined tar or other proprietary bitumens. The general experience was that for the first three years the surface has been satisfactory; in five years the surface coat, if not renewed, was worn away in spots; at the end of ten years the surface was generally rough and disintegrated, but still protected the foundation. In Hamilton and Toronto the tar macadam after five or ten years has been protected by a wearing surface of sheet asphalt, from one to two inches in thickness. Experience has indicated that tar of uniform quality and of composition within certain range of proportions, while susceptible to extremes of temperature, is not debarred by climatic or other conditions, as

a useful road material; that best results require a dense mixture, preferably proportioning the aggregate for maximum density; that some doubt may be attached to the complete durability of bituminous surfaces made by the penetration process, and suggesting that the grading of stone in this method, rather than having a uniform size, is desirable; that a moderately coarse aggregate should be brought to the surface, to overcome slipperiness and take up wear; that tar-concrete is less durable under concentrated wear than is sheet asphalt; that broken stone will provide a more stable structure than will water-rounded gravel when bonded by tar; that a paint and grit coat is necessary as a preservative as frequently as signs of surface wear or oxidation appear.

Surface Treatment of Park Roads: SPENCER CROSBY, Washington.

In building and rebuilding park roads in Washington in the last few years a heavy oil or tar binder, applied by the penetration method, has been used with most satisfactory results. For the surface treatment of existing macadam roads, emulsions, waste sulphite liquors, coal gas and water gas tars, and asphaltic oils have been experimented with and last have been found to give best results. One application per year is sufficient to keep the surface in excellent condition. During the last fiscal year 166,000 square yards of park roads were given surface application of oil or tar at an average cost of 2½ cents per square yard, not including cost of screenings. This compares with an average cost of 3.2 cents per square yard for watering in previous years.

Oyster Shell Roads: W. W. CROSBY, Johns Hopkins University.

General remarks on arguments for and limits to use of shells for road purposes. Descriptions of results in Maryland. Particular points to be observed in construction and specifications recommended. Use of bituminous material in connection with shells. Costs of construction and of treatment with bitumen. (Six photographs showing shell roads treated and untreated.)

Changes in Pitch under Exposure and Traffic: W. W. CROSBY.

Description of construction and analysis of tar used. Description of traffic conditions and record of traffic census. Description of results apparent. Analysis of tar surface after three years of use and of tar extracted from samples of this surface. Conclusions as to changes in tar that have apparently occurred.

The Chemistry of Modern Highway Engineering: PREVOST HUBBARD, Institute for Industrial Research.

The necessity of chemical training for modern highway engineers is discussed at some length, and an outline is given of what the author believes to be the essentials of such training. Columbia University has already made the chemistry of road materials a part of its new post-graduate course in highway engineering. It is believed that this training will establish closer relations between the highway engineer and the chemist. Modern conditions demand the work of specialists in highway construction as in many other branches of engineering, and it is not reasonable to expect that the man whose training has been primarily developed along engineering lines can satisfactorily apply the principles of other highly specialized subjects to his work without the assistance of those who have specialized in such subjects. Therefore, the highway engineer should not attempt the chemical testing of road materials, but should cooperate with the chemist in this matter.

A Review of the Use of Bituminous Materials in the Construction and Maintenance of American Highways during 1911: A. H. BLANCHARD, Columbia University.

The following table shows the characteristic developments in the use of bituminous materials during the years 1908, 1909, 1910 and 1911 under the supervision of the highway departments of Maine, New Hampshire, Massachusetts, Rhode Island, New York, New Jersey, Pennsylvania and Maryland. The quantities are square yards.

SURFACE TREATMENT OF ROADS

Tars and Tar-Asphalt Compounds	Fluxed Native Asphalts Oil Asphalts and Residual Asphaltic and Semi-asphaltic Oils	Light Oils
1908. 57,700	1908. 239,500	1908.....
1909. 95,500	1909. 910,600	1909.4,125,900
1910.123,400	1910.2,434,200	1910.9,890,400
1911.433,000	1911.7,980,000	1911.3,765,000

BITUMINOUS PAVEMENTS CONSTRUCTED BY PENETRATION METHODS

Tars and Tar-Asphalt Compounds	Fluxed Native Asphalts Oil Asphalts and Residual Asphaltic and Semi-asphaltic Oils	Light Oils
1908.. 37,800	1908.. 25,200	1908.....
1909..170,200	1909..2,077,400	1909.....
1910..339,300	1910..4,840,200	1910..26,500
1911..122,000	1911..8,600,000	1911.....

BITUMINOUS PAVEMENTS CONSTRUCTED BY MIXING METHODS

Tars and Tar-Asphalt Compounds	Fluxed Native Asphalts Oil Asphalts and Residual Asphaltic and Semi-asphaltic Oils	Light Oils
1908.. 52,100	1908.. 4,400	1908.....
1909..136,000	1909..219,500	1909.....
1910..158,000	1910..432,600	1910.....
1911.. 24,350	1911..508,100	1911.....

The most important developments during 1911 were as follows: the increased use of the mixing method of constructing bituminous concrete pavements due to the introduction of economical and efficient mixing plants and less fear of injunction and law suits brought by patentees; the manufacture of many types of gravity and pressure distributors for use in the construction and maintenance of bituminous surfaces and bituminous pavements built by penetration methods; the demand by many engineers for bituminous materials for bituminous surfaces which will set up in from 24 to 48 hours; increase in recording scientific data such as recommended by the special committee on the Use of Bituminous Materials of the American Society of Civil Engineers.

Organization of a Highways Maintenance Bureau of a Municipality: W. H. Connell, New York City.

It is, in the writer's opinion, desirable in the organization of a Highways-Maintenance Bureau to follow the theory of centralization of control. First comes the planning of an organization adapted to the needs of the municipality, then the proper control of the same, which can only be accomplished through the appointment of men especially qualified to supervise the work of the various branches of the organization. The responsibility of course should be centered in one man, and he should be familiar with the social conditions of the municipality and keep in close touch with the activities of the divisions under his control. All work should be initiated through job orders and unit cost records kept of the same. All street repairs, etc., should be done by the highways-maintenance force. All repairs to pavements between railway tracks over corporation cuts, etc., should be done through and under the supervision of the Highways-Maintenance Bureau. This procedure centralizes the responsibility and control of work coming under the jurisdiction of said bureau.

Utilization of Motor Truck Trains in the Maintenance of Truck Highways: L. W. Page, Office of Public Roads.

The object to be accomplished is the development of an automobile equipment which will include all the apparatus and facilities necessary to efficiently employ a repair gang of eight men in the maintenance of road surface over one hundred miles of roadway or more as the working conditions will permit. This purpose as set forth has three significant implications: First, that the cost of the equipment should be kept consistently low or within the range of customary expenditures in this direction; second, novel or especially manufactured apparatus should be avoided so that the equivalent apparatus can be secured in any locality, and, further, that existing investment in similar details of equipment can be made use of; third, that the outfit should be so flexible in its makeup as to readily serve a variety of utility or lend itself to peculiar requirements under varying conditions. In performing service in road repairing, the machine should incorporate as many of the requirements of a portable power plant as possible, such as hoisting, pumping, and, where necessary, air compression and power-shaft driving. The automobile chassis selected for recommendation is the 5-ton gas-electric type manufactured by the Couple-Gear Freight Wheel Company, Grand Rapids, Michigan. This chassis is fitted with a Sprague electric hoist, which can be used for a variety of purposes. The motor of this hoist is directly connected to a rotary pump which can be used to furnish bituminous material from a tank carried on the machine through a distributing device permanently attached to the rear of the chassis. An electric air compressor and a power sweeper could also be attached to the machine. The chassis can be fitted with a removable platform body, with or without stakes or side racks; and it may also be fitted with a steel dumping body, the forward half of this body to be fitted with removable partitions to provide spaces of one or two cubic yards capacity for carrying different sizes of road material. The rear half of the body may be used for carrying the bituminous heating tank. Seats for four men and spaces for tools are provided between the dumping body and the driver's seat. The latter is made wide enough to carry three men beside the driver. It would be impossible to use standard wagons as trailers for carrying material, and a sprinkling wagon or bituminous tank mounted on its own wheels could also be carried behind the tractor. It would prob-

ably be necessary to establish supply stations at intervals along the road to be maintained with this equipment.

Underground Pipe Construction in Streets: C. E. BOLLING, Richmond, Va.

Much money could be saved in street construction and maintenance if pipe systems, such as for water, gas, sewer, etc., were laid before the surface of the roadway was constructed. All main pipes should be placed and connecting pipes laid to each lot, whether the latter are occupied or vacant. The estimated annual cost on such connections, assuming a 4 per cent. interest on the outlay, is 96 cents. The rapid rate of growth of communities so improved is marked. The increased value of abutting property, due to the conveniences obtained, creates tax receipts generally in excess of this annual interest. The cost of making pipe connections through improved roadways is at least 60 per cent. greater than through unimproved ones, and the cost of restoring and maintaining the pavement is doubled.

Impact Testing Machine for Pitch: W. H. FULWEILER, Philadelphia.

This apparatus was designed to determine the relative binding qualities of bituminous materials used in road construction and maintenance. The material to be tested is enclosed as a thin film between two steel dies. The dies are designed to avoid the effect of suction. An excessive breaking load is applied by the impact of a falling weight, and the resistance to rupture of the film is recorded by a spring balance provided with a maximum indication hand. This form of apparatus may be used to compare the binding qualities of any grade of material. In a modification of this apparatus a pendulum in falling separates the dies, and automatically records the energy absorbed. The results obtained have not yet been completely analyzed, but apparently they will serve to differentiate classes of materials and indicate the most effective viscosity of any material for road use.

Centrifugal Method for the Determination of Free Carbon: W. H. FULWEILER.

This method was designed to afford rapid and reasonably accurate results to obviate the danger of handling carbon bisulphide in the laboratory. The material is weighed with a stoppered Goez phosphorus tube dissolved in CS_2 with shaking and centrifuged until the precipitate ceases to contract. The percentage may then be read off directly. The tubes are calibrated for the particular class of material to be tested by reference to standard samples. Care must be taken to keep the tubes scrupulously clean. The lower the percentage of free carbon the closer this method checks with the ordinary gravimetric method. In this method the carbon bisulphide is not exposed to the air and considerably smaller quantities are required.

Cost of Road Building with Convict Labor: J. H. PRATT, Chapel Hill, N. C.

The author has not submitted abstract.

The following papers in this group were read by title in the absence of authors and manuscripts:

Street Asphalt Paving Mixtures, and Value of Blown Asphalts and their Manipulation: H. B. PULLAR, Chicago.

Organization of the Engineering Department of Coleman du Pont Road, Inc.: F. M. WILLIAMS, Delaware.

Organization of Convict Labor on the Virginia State Highways: P. ST. J. WILSON, Richmond, Va.

Some Limitations of Distributing Machines: H. B. DROWNE, Columbia University

Voids in the Aggregates of Bituminous Concrete Pavements: A. H. BLANCHARD, E. R. DONLE and C. M. HATHAWAY, Columbia University.

It is expected that the papers of this group will be published in book form at an early date.

G. W. BISSELL,
Secretary

SOCIETIES AND ACADEMIES

THE HELMINTHOLOGICAL SOCIETY OF WASHINGTON

THE seventh regular meeting of the society was held at Dr. Ransom's residence on December 19, 1911, Dr. Ransom acting as host and Mr. Crawley as chairman.

Dr. Pfender presented a brief note on the desirability of zoologists and medical men using *Treponema* rather than *Spirochæta* for the organism causing syphilis.

Mr. Foster presented the following note:

Analysis of the Results of 87 Fecal Examinations of Sheep Dogs for Evidences of Parasitism.

Order No. 176 of the Bureau of Animal Industry requires that all collie or sheep dogs imported to this country shall be held in quarantine pending the result of a fecal examination to determine the presence or absence of the gid tapeworm. As it is difficult to distinguish the eggs of the gid tapeworm from those of other less injurious species, all dogs found infested with tapeworms are given a suitable tæniafuge.

Since November 25, 1910, when this order went