

CLOSING THE SESSION.

The Scientific Congress at Minneapolis Nearing Its End.

INTERESTING PAPERS READ.

The Discussion of Great Popular Concern Outside of Scientific Circles.

THE CABLE RAILWAY SYSTEM.

It is Thoroughly Discussed and Approved by a Practical Man.

THE ELECTION OF OFFICERS.

A Large Number of Distinguished Persons Admitted to Fellowship.

The scientists met in general session in the chapel at ten o'clock yesterday morning with president Young in the chair.

NEW MEMBERS.
The following recommendations for membership were read and elected by the ballot of the secretary:

- A. D. Rhame, Minneapolis, Minn.
- George C. Ripley, Minneapolis, Minn.
- Miss Kate Robson, Indianapolis.
- George S. Spencer, St. Cloud, Minn.
- Dr. R. O. Sweeney, St. Paul, Minn.
- Wm M Tenney, Minneapolis.
- Rev. J. Peter Uhlen, St. Peter, Minn.

NEW OFFICERS.
The secretary announced the following nominations of officers for the ensuing year, by the standing committee, and upon a ballot being taken nearly all were elected unanimously:

- President—J. P. Lesley, Philadelphia, Pa.;
- General Secretary—Dr. Alfred Springer, Cincinnati, O.
- Assistant Secretary—E. S. Holden, Madison, Wis.

Section A—Vice president, H. T. Eddy, Cincinnati, Ohio; secretary, G. W. Hough, Chicago, Ill.

Section B—President, John Trowbridge, Cambridge, Mass.; secretary, D. C. Hodges, Salem, Mass.

Section C—Vice president, John W. Langley, Ann Arbor, Mich.; secretary, Robert B. Warden, North Bend, O.

Section D—Vice president, R. H. Thurston, Hoboken, N. J.; secretary, J. B. Webb, Ithaca, N. Y.

Section E—Vice president, N. H. Winchell, Minneapolis; secretary, Eugene A. Smith, Tuscaloosa, Ala.

Section F—Vice president, E. D. Cope, Philadelphia, Pa.; secretary, C. E. Besley, Ames, Iowa.

Section G—Vice president, D. G. Wormley, Philadelphia, Pa.; secretary, Romyn Ames, Iowa.

Section H—Vice president, E. S. Morse, Salem, Mass.; secretary, W. H. Holmes, Washington, D. C.

Section I—Vice president, John Eaton, Washington, D. C.; secretary, C. W. Smiley, Washington, D. C.

FELLOWS OF THE ASSOCIATION.
The standing committee nominated the following members to the fellowship of the association, and they were elected them, only two names having been scratched by a few of the members:

- Abbott, Dr. Chas. C., Trenton, N. J. (29).
- Anderson, Rev. Joseph, Waterbury, Conn. (29).
- Arthur, J. C., Charles City, Iowa. (21).
- Ashburner, Charles A., 907 Walnut street, Philadelphia, Pa. (31).
- Barnard, Edward E., care R. Poole, Cherry and Union streets, Nashville, Tenn. (26).
- Bartlett, Prof. Edward J., Dartmouth college, Hanover, N. J. (28).
- Billings, Dr. John Shaw, Washington D. C. (28).
- Buckham, Dr. George E., Dunkirk, N. Y. (25).
- Burr, Prof. Wm H., Troy, N. Y. (31).
- Carmichael, Charles, Director of Magnetic Observations, Toronto, Can. (31).
- Case, Col. Theo S., Editor Western Review of Science, Kansas City, Mo. (27).
- Chandler, Prof. Chas Henry, Ripon, Wis. (28).
- Clapp, Miss Corneilia M., Mount Holyoke Seminary, South Hadfield, Mass. (31).
- Crandall, Prof. A. H., Lexington, Ky. (29).
- Curtis, Dr. Lester, 1558 Wabash avenue, Chicago, Ill. (29).
- Davenport, Dr. F. M., D., 751 Trenton st., Boston, Mass. (29).
- Dorsey, Rev. Jas. O., Bureau of Entomology, Washington, D. C. (31).
- Dudley, Prof. Wm R., Ithaca, N. Y. (29).
- Eaton, Hon. John, U. S. Commissioner of Education, Washington, D. C. (25).
- Fairchild, H. L., 153 E 47th street, New York, (28).
- Fernald, Prof. M. C., State Agricultural College, Orono, Me. (24).
- Fletcher, Miss Alice C., care Peabody Museum, Cambridge, Mass. (29).
- Fletcher, James, Library of Parliament, Ottawa, Can. (31).
- Gilroy, Spencer H., Cleveland, O. (29).
- French, Prof. Thos. Jr., Urbana, O. (30).
- Gallaudet, Dr. M., Pres. Nat. Deaf Mute College, Washington, D. C. (58).
- Gulley, Prof. Frank A., Agricultural College, Orono, Me. (24).
- Gray, Dr. Elisha, Highland Park, Ill. (28).
- Hall, Prof. C. W., Univ. of Minnesota, Minneapolis, Minn. (28).
- Halsted, Byron D., 245 Broadway, New York, (29).
- Haneman, C. E., Troy, N. Y. (19).
- Hardy, Prof. A. S., Dartmouth college, Hanover, N. H. (24).
- Holman, Silas W., Mass. Inst. of Technology, Boston, Mass. (31).
- Holmes, Wm H., Smithsonian Institution, Washington, D. C. (30).
- Hosen, Lewis M., Johnston building, Cincinnati, Ohio (30).
- Hickies, Jed, Stanton, Va. (31).
- Hovey, Rev. H. C., New Haven, Conn. (29).
- Jordan, Prof. David S., Bloomington, Ind. (31).
- Kellcott, David F., Buffalo, Y. Y. (31).
- Kersner, Prof. Jefferson E., Lancaster City, Pa. (29).
- Kimcutt, Leonard P., Worcester, Mass. (28).
- Kunz, G. F., care Tiffany & Co., New York, N. Y. (29).
- Landrath, Prof. Olin H., Vanderbilt uni., Nashville, Tenn. (28).
- Larkin, Edgar L., New Windsor, Mercer Co., Ill. (28).
- Mackintosh, James B., School of Mines, Columbia Coll., N. Y. (27).
- Smith, Edwin, Assistant U. S. Coast and Geodetic Survey, Washington, D. C. (20).
- Upton, Winslow, Army Signal Office, Washington, D. C. (29).
- Walmsey, Dr. W. H., 1016 Chestnut street, Philadelphia, Pa. (28).
- Webb, Prof. J. Barkitt, Ithaca, N. Y. (31).
- Wheeler, Prof. C. G., University of Chicago, Chicago, Ill. (29).
- Whiting, Miss Sarah F., Wellesley College, Wellesley, Mass. (51).

THE CLOSING.
The standing committee announced that the formal closing meeting of the association

will be held this morning, when the adjournment will occur.

A communication from Philadelphia citizens cordially inviting the holding of the thirty-third annual meeting of the A. A. S., in that city was read by President Young, and was received with applause and the invitation accepted.

Adjourned for sectional work.

Announcements of the Local Committee.

EXCURSIONS.
A free excursion will be given by the St. Paul & Duluth railroad to-day from Minneapolis to Taylors Falls and return. This will afford about three hours time for the examination of the dunes and the interesting geological features of the locality. The train will leave the Manitoba depot in West Minneapolis at 8:10 a. m., and will leave Taylors Falls at 3 p. m.

An excursion will be made to Winnipeg on the St. P. M. & M. railway and return for \$15. Tickets will be had at the Minneapolis office on Thursday, or any day thereafter during the week. Parties will travel on the regular trains, and are requested to register their names at the secretary's office beforehand in order that proper arrangements may be made by the officers of the road.

Excursion parties may be organized to the Yellowstone Park and return at the following rates, on the regular trains of the Northern Pacific railroad:

- A party of 15 or more.....\$65 each.
 - A party of 10 or more.....75 each.
 - A party of 5 or more.....80 each.
- These tickets must be purchased in lots, but they are good to go and return in any reasonable time after the sale. The parties may go in company or singly.

Sections A and B—Mathematics and Astronomy and Mechanical Science.

The section of Mechanical Science met yesterday with the Section of Mathematics and Astronomy in the room of the latter.

The session of section A was opened by Prof. C. A. Young with remarks on **THE PLANET URANUS.**

He said that the result of the past year's observations at Princeton with the great equatorial had been to indicate a slight ellipticity in the planet and also to show that there existed upon its surface certain apparent dents or marks, the latter being perhaps yet to be utilized in ascertaining the ellipticity of the body would appear to indicate a high rate of rotation.

The bending of the belt toward the plane of revolution of the satellite is also observable. The next subject was on the light variations of T. Monocrotis" by E. F. Sawyer. The paper not having arrived it was read by title only.

ORBIT OF THE GREAT COMET.
"Orbit of the great Comet of 1882" was the subject of the next speaker, Edgar Frisbie, of Washington, D. C. The orbit as computed at Washington was computed from their observations taken with great care and precision, though they may not have been entirely exact owing to the probability of the nucleus of the comet being made in observing the nucleus which appeared to shift. The orbit as calculated however, corresponded very closely with the best observations taken elsewhere.

The track of the comet was almost entirely in the southern hemisphere, its time beneath the plane of the elliptic being 733 years and above the plane two and a half hours. The paper was extremely interesting but far above the comprehension of the ordinary reader, technical terms abound which none could understand outside the astronomical student.

SURFACES OF THE SECOND DEGREE.
"Descriptive geometrical treatment of surfaces of the second degree" was the title of the next topic presented by J. B. Webb. The subject was illustrated by geometric figures drawn on the blackboard and was so technical and abstruse as to prevent a reproduction.

LONG PLANE SURFACES.
W. A. Rogers next gave a method of testing long, plane surfaces, applicable to the alignment of planer-beds, lathe beds, heavy shafting, etc. He spoke only ten minutes and he listened to with close attention but it would require a scientist to give a readable synopsis of the learned talk.

ROTATION OF DOMES.
"The Rotation of Domes" was the next topic by G. W. Hough. The history of all domes in the United States is that they are difficult to operate when they get old. The dome of the observatory of Chicago is of cylindrical form and very high. Domes are liable to get out of order through the settling of wall, and it sometimes becomes almost impossible to move them on account of their great weight.

The president, A. M. Young, said gas engines are used in moving domes but he thought steam engines better for the purpose. The next papers, "The Commercial and Dynamic Engine of the Steam Engine," and "Centrifugal Action in Turbines" were read by title.

TERRA COTTA LUMBER.
T. R. Baker next read an interesting paper on "A Comparison of Terra Cotta Lumber with Some Other Building Materials." The terra cotta lumber is composed of refuse pottery clay and sawdust mixed. Its breaking weight and resistance are good. Its permeability to air is found by careful experiment to be eighty times as great as that of pine and 135 times that of brick. Its hold upon nails is less than one-half that of pine and its heat conductivity not nearly the same as brick. It is a very porous material, and in a sanitary point of view is therefore preferable to less porous materials for walls, for it permits a better circulation of air, holds less moisture and carries off less heat. It is therefore believed to be a better building material than brick. By experiment it was found that the average time required for the comparison volume of air to pass through pine was 1.161 seconds and to pass through brick 180 seconds, but when it was forced through terra cotta lumber only one and one-third seconds were required. Although terra cotta lumber has been considerably advertised and is produced in considerable quantities at Perth Amboy, New Jersey, yet there is doubtless little known of it where lumber is so abundant. The refuse pottery clay is found abundantly in New Jersey and elsewhere. It is prepared by thoroughly mixing the sawdust with the clay and then burning out the sawdust. Each particle of the sawdust leaves a cavity and the cavities thus formed render the material quite porous. The lumber is cut with saws and may be worked with ordinary tools.

DESCRIPTIVE GEOMETRY.
C. M. Woodward gave the next paper on "descriptive geometry" and used algebraic formulas in connection with geometry in his blackboard illustrations.

The same gentleman also spoke for five minutes on the velocity of the piston of a steam engine, showing his ability as a first-class mathematician. He was followed by J. B. Webb, who spoke for five minutes on improvements in shaping machines. He drew the best form of a machine and suggested a new method of doing away with the variable spring in the tool end of the ram at different points in its motion. This is effected by fixing the ram upon the bearings and thus causing them to do the moving and securing a constant distance from the fulcrums in the different points of the ram. The fol-

lowing papers were read by title and then the sections adjourned:

STANDARD TIME POINTER.
"A standard time pointer," by Samuel Emerson; "Investigations of Light Variation of Sawyer's variable," by J. C. Chandler; "Tidal observations on soundings distant from shore," by J. M. Batchelder; "On a method of observing eclipses of Jupiter's satellites," by P. D. Todd; and a "System of algebraic geometry," by Samuel Emerson.

Section B—Physics.
In the absence of Prof. Rowland, Prof. Mandenhall called the meeting to order, and was elected vice president pro tem.

CALIBRATION OF A GALVANOMETER.
The first paper presented was that on "A Method for the Calibration of a Galvanometer," by Prof. B. F. Thomas.

The method consists in passing definite parts of a unit current through the galvanometer, noting the deflections and plotting the curve. A battery of any sort is joined in a circuit with a sensitive galvanoscope. The paper was illustrated with a descriptive black-board drawing, without a reproduction of which it is practically impossible to give the reader an intelligent report, the ideas of the workings of the proposed method.

SELENIUM CELL.
O. E. Fritts being absent, Prof. Mandenhall presented an abstract of the paper on a new form of selenium cell and some remarkable electrical discoveries made by its use.

SOLIDS AND LIQUIDS.
Prof. H. T. Eddy, of the University of Cincinnati, presented a lengthy paper on "Liquifaction, Vaporization and the Kinetic theory of Solids and Liquids" of which the following is an abstract:

In a solid, in which the molecules are evidently held at nearly fixed mean distances by cohesive and elastic forces, there are two kinds of partially constrained freedom of motion possible for each molecule as a whole; first a motion of its center in a small orbit of more or less irregular shape about a mean position; and second, a more or less irregular pendular motion of oscillation about a mean directional position. Both of these motions can be properly treated as vibratory motions, and the laws of force under which the motions occur, though somewhat unlike, have a general resemblance.

When a solid is liquefied, it is evident that the molecules slide on each other with facility, which is equivalent to supposing that the molecules of the body have become perfectly free as to directional position; and this may be explained by supposing that the pendular oscillation has been changed into rotation. In ordinary evaporation into the atmosphere, without ebullition, only those molecules escape whose kinetic energy is the surface as to enable them to overcome cohesion, and only so many will escape as will enable the vapor to fulfill approximately the law of Gay Lussac. There are three kinds of vaporization possible, evaporation, ebullition and gasification. There appears to be only one kind of liquification (melting) which is most analogous to gasification, and without further reasoning it will appear that for these substances, whose melting power is lowered by pressure, there must be a critical temperature of melting, above which the body will be liquid, whatever be the pressure; i. e., no pressure can lower the melting point beyond a certain amount dependent upon the constitution of the body.

It appears from experiment that the specific heat of mercury is nearly the same in its solid and liquid states as it should be in case its molecules are monatomic in both states. It would be of great interest to know whether the specific heat of mercury gas has the same value. It is noticeable that the latent heat of liquification of mercury is extremely small, which would lead to the hypothesis that the atoms of mercury are very nearly round and smooth and that the rotary energy of a molecule of mercury is but a very small fraction of its total kinetic energy.

These conclusions are drawn from the specific heat of elementary substances whose molecules consist of but two like atoms are in general confirmatory of the theory proposed in this paper, for the amount of rotary energy for such substances should be a less fraction of the total energy than in bodies consisting of a larger number of atoms, and the per cent. of dissociation should also be less. Now, in fact, for such bodies the specific heat in the liquid state does not, in general, greatly exceed that in the solid.

KINETIC THEORY.
A paper on the Kinetic theory of melting and boiling, was presented, also by Prof. Eddy. The object of the paper, he said, was to consider the probable physical state of solid bodies, especially as to the amount of energy, the different degrees of freedom possible in such bodies and show that the same hypothesis of equal ultimate atoms, would cause solids, which are in equilibrium by radiation, to be also in thermal equilibrium when brought into contact, i. e., when the equilibrium depends upon the collisions of the molecules. Thermal equilibrium which has been established by collisions of gaseous and solid molecules, will continue to exist when its continuance depends upon radiation between equal and similar ultimate atoms, which are set in vibration by collisions with molecules; or to state it differently, it remains to be shown that the ultimate atoms of a gas and a solid in contact, each give the same mean vibratory energy, with respect to each other. This appears to be a direct consequence of the principles of constrained motion.

It is very necessary that the impacts of a pair of solid molecules with each other should be such as to mutually impart and receive the same mean amounts of energy as those of a gas and a solid, to cause it to be a matter of indifference, whether a given solid molecule struck by another solid molecule or by a gaseous molecule will receive its proper proportion of energy, which it form part of a solid or gaseous molecule.

The next paper was by Prof. Gustavus Hinckles, of Iowa, on the tracings of soft registering instruments and the value of the U. S. indications for Iowa in June and July, 1883.

The speaker attacked the system of the United States signal service. He cited instances, especially in June, in the state of Iowa, where there were twelve stations well distributed over the entire area, which reported every five days by card, to show that it was a matter of conjecture and not a scientific conclusion. The actual predictions for the state for month of June contained the statement that there would be no rain in nine days, and out of nine days it rained three, and there were three other days that had stated would be rainy days which were again missed. Out of twelve predictions made by the signal service in June six pointed at one end. They are generally pale, and more or less covered with a flocculent secretion.

The second paper was "Notes on the potato beetle and the Hessian fly of 1883," by Prof. E. W. Claypole of New Bloomfield, Pa. It is thought the Hessian fly injured the later wheat much more than the early crop. The professor's observations had been made on winter wheat which the insects especially attack. The speaker said there were two broods of the insects, spring

and autumn. In the discussion it was the opinion of several that the dying of the stalks did not kill the larvae. No second brood of potato beetles appeared in 1882, as usual. This year, too, they had been almost entirely absent. For the cause of this the speaker was in doubt. Prof. Riley thought the reason must be either in their destruction by poisonous parasites or by reason of extra dry weather. Prof. Claypole thought the reason could not be dry weather, as during a previous summer which was excessively dry the beetle flourished and was very plentiful.

"Observations on Cephalopoda," by Prof. A. Hyatt, was ready by title in the absence of the author.

"Some recent discoveries in reference to Phylloxera," by Prof. Riley was next given. He said that every new fact in the life history of the insect has an exceptional interest because of its bearing on the destructive grapevine phylloxera. The genus is more largely represented in this country by a number of gall-making species on the different hickories. The galls are produced for the most part in early spring; the winged females issue therefrom in early summer and for the remainder of the year the existence of the insect has been a mystery. The impregnated egg is laid in all sorts of crevices upon the twigs of the oak and the old galls, in which last case they fall to the ground, and up to this time they have remained unharmed and will in all probability not hatch until next spring, thus corresponding with the winter egg of the grape phylloxera.

Dr. W. G. Farlow, of Cambridge, Mass., followed with a paper on various forms of Algea found in the United States. He noted four distinct poisonous forms of these plants, three of which were found in the State of New York. The quality of water and Algea affect the quality of drinking water and give it an unpleasant odor and taste. They also constitute a source of danger. The occurrences at Waterville, being recorded by Prof. Arthur, are instances of their effect upon the latter. In Boston they have been the cause of much harm to persons. The speaker predicted for Minneapolis a time when the present water supply would be rendered wholly unfit for use by the collection of sewage, and when the possible presence of the poisonous alga in the surrounding lakes would necessitate great care in the choice of a future source of water.

Section E—Geology.
The business in this section was opened by a paper by Mr. Dawson, which led to a general discussion. This was followed by a paper on the "Eroding Power of Ice," by Prof. Newberry. This was followed by a paper on "The Kame rivers of Maine," by G. H. Stone; the "Pre-Cambrian rocks of the Alps," by T. Sterry Hunt; the "New Madrid Earthquake," by James Macfarlane; the "Hamilton Sandstone of Middle Pennsylvania," by E. W. Claypole.

Section H—Anthropology.
Business in this section was opened with an exhibition of a stand for mounting skulls, invented by E. E. Chick and explained by Prof. F. W. Putnam.

The paper on "Osage War Customs," by Rev. J. O. Dorsey, was read by Vice President O. T. Mason, and with its illustrations proved most interesting.

The first illustration was that of a camp, in the first instance, and the division of the tribe in order of rank, order followed when on the march. The paper embraced a minute description of the customs of the tribe, marriage and mourning ceremonies, dances, etc., the full understanding of which was very materially assisted by the illustrations.

"Accidents or mode signs of verbs in the Iroquois dialect," by Mrs. Erminnie Smith, was read by title, the authoress being absent.

The correspondence between the prehistoric map of North America and the system of social development," was the title of a paper read by Prof. S. D. Peet. The subject was divided into three divisions: 1. Geographical environment. 2. Ethic characteristics, and 3. social surroundings. The peculiarity of the American continent was peculiarly favorable to the study of primitive life.

The aborigines are low in the scale, and differ from any intruded race. The isolation of the continent accounts for this. There is no trace found here of the Homicide age. The symbolism, mythology, etc., are unique and homogeneous. The three grades of society are manifest. They consist of savagery, barbarism and civilization. The three stocks of the human family correspond to these divisions. The grades of society are shown differently on the two continents. The habits of life, customs of a people, etc., partake largely of their climatic surroundings. Village life is characteristic of the three stages. It has been generally supposed that the American race was of but one stock, but it has been shown that the aborigines were of two stocks, part coming from the east and others from the west. This diversity of race descent may account for much that has been unexplainable heretofore as to the differences existing among certain tribes in the same surroundings.

Prof. E. S. Morse, of Massachusetts, delivered a short lecture upon the "Kitchens of the East," describing the utensils used and manner of cooking food, illustrating his subject as he proceeded. The same gentleman followed with a brief dissertation upon the "Method of arrow release." Both lectures were interesting, but requiring no special mention.

RECESS UNTIL 2:30 P. M.
AFTERNOON SESSION.
The first paper upon coming together for the afternoon session was "Game drives among the emblematic mounds," by Prof. S. D. Peet. The speaker commenced by saying that the mounds are divided into two classes. The mound builders now being considered were hunters. Their mounds were surrounded by animal figures, as objects of worship and for this purpose. Another grade are the burial mounds, such as found in the Mississippi valley. Another grade are those in the shape of stockades, showing their occupancy by a warlike people. Still another grade are those found near Portsmouth, Ohio, consisting of high walls enclosing villages. The other is the pyramid shape, built by sun worshippers. The speaker then went on to describe a village of the first named grade found in Wisconsin, and explaining the mounds surrounding as made for game drives.

"Studies in the Iroquois concerning the verb to be and its substitutes," by Mrs. Erminnie Smith, was read by title in the absence of the author.

"Vestiges of glacial man in central Minnesota," by Miss F. E. Babbitt, of Minnesota, was read by Prof. Upham. It appeared from the paper that Miss Babbitt has given a good deal of her time for the past five years to the study of her subject, and her paper was one of the most valuable read before the section during the session. The stone discoveries upon which the paper was based, were found in the pyramidal mounds, near Morris, Minn. After the reading was concluded, Prof. Putnam spoke briefly in relation to the discoveries made by Dr. Abbott in New Jersey, some of which are unquestionably artificial productions, and prove that man resided in that region prior to the last glacial deposit or, as some claim, between two glacial deposits. The discoveries made here seem to be of the same character of

those in New Jersey. Their age belongs to geologists to ascertain. It is considered the discovery very important and the paper one of great value. Prof. Peet took issue with Prof. Putnam as to the value of the discoveries, and thought that if paleotics had to depend upon such a shallow foundation as was furnished by these the matter had better be dropped.

"A classification of the sciences," by Major J. W. Powell was the next and it was the last paper proper before the section. To commence with the speaker said classification divided the sciences into three great groups the physical, biology and anthropology, the purpose of which he followed through these respective channels. Physics he divided into molecular, stellar and mechanical. Biology is divided into botany and zoology, and anthropology, philology, technology and philosophy.

At the conclusion of the reading of this paper the section adjourned sine die.

Section J—Economics and Statistics.
Mr. C. W. Smiley, a member of the fish commission, read the first paper on the German carp and its introduction into the United States. The United States fish commission, he said, had some years ago imported from Germany thirty or forty pairs of this fish. They were placed in breeding ponds in Washington and have increased many fold, the number spawned now reaching nearly 400,000 a year. Many of the young fish have been sent in all parts of the United States, and are rapidly being propagated, as the carp is a very fine food fish. The carp is naturally a warm water fish, and in the waters of the southern states grow with astonishing rapidity and to great size.

They also do well in the cold waters of the north. The propagation of carp has been taken up as a private speculation, and carp are sold for breeding purposes as high as \$5 a pair. As to the economics of this subject, Mr. Smiley stated that fish culture was more and more becoming a part of the farmer's occupation, and he was of the opinion that not very far in the future most of the farmers of the country would have little fish ponds in their door yards, both as a method of obtaining food and as an ornament to the homestead.

CABLE CARS.
Prof. E. Cox read an interesting paper on cable cars, which is reproduced entire. The introduction of the wire cable street car system in San Francisco by A. S. Hallidee, marks a new era in street railway traffic, and is destined to do away with the horse car system. For a time it was thought that though the cable system proved a grand success in San Francisco, where there is neither frost or snow, that in the rigorous climate of the cities east of the Rocky mountains, it could not be made to work throughout the year, on account of snow and ice accumulating in the underground trench where the endless cables has to run. But the experiment has been tried on the most important street line in Chicago, and though subjected at the start, to one of the most inclement winters known for years, and under an accumulation of more than four feet of snow, the cable cars pushed their way through the ten miles of line without loss of time, and kept the track clear when the horse car lines were compelled to stop. By the cable system a speed of fifteen miles an hour may be had where the street traffic is light, and by the arrangement of drums this rate of speed may be reduced and regulated to the condition of the road crowded thoroughfare, or when turning corners, as is actually demonstrated in Chicago.

The cable system not only insures a more speedy and agreeable means of travel by relieving the sensitive passenger from the annoyance of nery and overtaxed horses, and other nuisances, but as will be shown, it is a more economic motor.

Broody Merrill, chairman of the horse car railroad convention, held at Boston last March, said: "There are in the United States, Canada and 415 street railways, giving employment of about 85,000 men, 18,000 cars and 100,000 horses in daily use. These horses consume 150,000 tons of hay and 111,000,000 bushels of grain. Their 3,000 miles of track represent an invested capital of \$150,000,000. The number of passengers annually carried is 1,212,460,000. About 100 miles of New York there are 110 miles of horse railway and 11,800 horses are used to operate them. The horses together with their harness, expensive lands and stables, feed and grains, make the operating expenses by including interest, \$5,104,596.79-100 per annum. The average life of the street car horse in New York is less than three years. This terrible abuse of animal life should enlist the public sympathy, and commend at once the cable system, and commend at once the horse car system, with the use of horses, where there are sufficient funds to fearfully overwork. The present horse railways may readily be adapted to the cable system, without serious interference with the travel. It simply requires the making of a trench in the center of the road in which to place the tube through which the cable is run. That eminent authority in economics in railway passenger and freight traffic, S. F. Pierson, who is the assistant pool commissioner of the trunk lines from the Atlantic seaboard to the west shows from official tables that the horse railroads of New York city, which have cost including equipment and real estate, a trifle less than \$23,000,000 carried in the year 1881, 154,000,000 passengers, at a cost of 3.6 cents for each passenger, while if the cable system had been employed instead of the horse cars, the cost of carrying them would have been but 1.46 cent for each passenger, a saving of 2.15 cents on each passenger. A saving of two cents on each passenger carried would amount to \$24,240,000 yearly, a sum equal to the interest at 6 per cent on (\$400,000,000) four hundred million dollars. Gen. W. Sewell, United States senator of New Jersey, a practical railroad engineer and of the management of the Pennsylvania Railroad company, who has personally investigated the cable system, both in San Francisco and Chicago, says that within ten years the cable system will supersede the horse cars on every considerable street railway line. The former system is applicable to grades where it would be impractical to use the latter. In San Francisco the cable cars ascend steep hills 250 feet high with as much facility as moving on level ground, the descending car compensating for the strain on the cable, made by the ascending car. Mr. Hallidee, the inventor of the cable system, has received \$50,000 cash and £130,000 in preferred shares for the use of his patents in England, and the cable cars will soon be running in that country. For all portions of the United States except the Pacific states the patents have been purchased by a syndicate in New York, and preparations are being made to have the system introduced in all the principal cities and towns throughout the Union. The cost of the cable car system plant is shown to be about \$70,000 per mile of roadway. No grading is required and the rails are laid in the usual manner of putting down the horse car tracks.

BUILDING ASSOCIATIONS.
Prof. Edgar Frisbie, of Washington, presented a paper on "Building Associations." After elaborating at great length upon the theories as the correct principles upon which building associations should be based, he presented the following points: The fundamental principle is

this: Both the loaner and the borrower is mutually benefited so far as possible. Each stockholder pays \$1 per month, shares and has the privilege of borrowing from the association at any of its monthly meetings, the exact amount and premium to be paid thereon to be decided by the competition for the money; for this sum he pays \$1 extra each month until the close or expiration of the limitation of the stock or until his payments on the original block with interest at 6 per cent, will equal the amount borrowed.

In the event a borrower desires to settle up at any monthly meeting with the association he is credited with all the payments he has made on his stock, together with the interest, and charged with the amount borrowed.

The botanical club had another interesting field meeting yesterday afternoon.

No session of the section devoted to histology and microscopy was held yesterday.

The members of the local committee are especially requested to be in attendance at the session to-day and also at the lunch of 1 o'clock.

After to-day, the public can get down to normal life. This intensely scientific experience has been a ponderous strain upon the mental organism.

In the election of officers yesterday, a compliment was paid the scientific ability, conscientiousness, and geological learning of Prof. N. H. Winchell, of Minneapolis, state geologist and professor of the state university, in electing him to the vice presidency of section E. for the ensuing year.

THAT OUTRAGE.
Additional Details of the Affair—A Demeaned Policeman Suspended.

Yesterday the GLOBE gave an exclusive account of an attempted rape upon a child seven years of age, but owing to the lateness of the hour at which the information was received, the report was lacking in a few minor particulars, the essential features, however, being in the main correct.

The report upon which the dastardly outrage was attempted, was that of a seven year old daughter of a man named Ahl, residing at No. 714 DeSoto, and the brute who made the assault is one John Taylor, a young man seventeen years of age, formerly in the employ of Englebrecht, the grocer, at the corner of Lafayette avenue and Westminster street. Taylor decoyed the child into a barn and after attempting the assault and being frightened off by her screams, he went back to the store again. The case was afterwards reported to Officer Dillon, who put him in jail for some unknown reason let him go again and never reported it at headquarters. His conduct was considered most reprehensible and yesterday he was before the mayor for an investigation, the result being that he was ordered to arrest the man or quit the force. Chief Clark saw the child's mother yesterday and learned that the wretch did not inflict any injury upon her person. The force are making every effort to take him into custody. He was afterwards reported to Officer Dillon, who put him in jail for some unknown reason let him go again and never reported it at headquarters. His conduct was considered most reprehensible and yesterday he was before the mayor for an investigation, the result being that he was ordered to arrest the man or quit the force. Chief Clark saw the child's mother yesterday and learned that the wretch did not inflict any injury upon her person. The force are making every effort to take him into custody. He was afterwards reported to Officer Dillon, who put him in jail for some unknown reason let him go again and never reported it at headquarters. His conduct was considered most reprehensible and yesterday he was before the mayor for an investigation, the result being that he was ordered to arrest the man or quit the force. Chief Clark saw the child's mother yesterday and learned that the wretch did not inflict any injury upon her person. The force are making every effort to take him into custody. He was afterwards reported to Officer Dillon, who put him in jail for some unknown reason let him go again and never reported it at headquarters. His conduct was considered most reprehensible and yesterday he was before the mayor for an investigation, the result being that he was ordered to arrest the man or quit the force. Chief Clark saw the child's mother yesterday and learned that the wretch did not inflict any injury upon her person. The force are making every effort to take him into custody. He was afterwards reported to Officer Dillon, who put him in jail for some unknown reason let him go again and never reported it at headquarters. His conduct was considered most reprehensible and yesterday he was before the mayor for an investigation, the result being that he was ordered to arrest the man or quit the force. Chief Clark saw the child's mother yesterday and learned that the wretch did not inflict any injury upon her person. The force are making every effort to take him into custody. He was afterwards reported to Officer Dillon, who put him in jail for some unknown reason let him go again and never reported it at headquarters. His conduct was considered most reprehensible and yesterday he was before the mayor for an investigation, the result being that he was ordered to arrest the man or quit the force. Chief Clark saw the child's mother yesterday and learned that the wretch did not inflict any injury upon her person. The force are making every effort to take him into custody. He was afterwards reported to Officer