Schoolhouses should be built in parks, and every thing possible done to make them attractive both outside and within. Ventilation is a matter of prime importance. Among the diseases caused or favored by schools, he places the following: contagious diseases, headaches, eye affections, chorea, and consumption.

This paper was discussed by several of the members of the association. Dr. Lindsley of Tennessee said that there were two points which he wished to emphasize: 1. Medical men must arouse public attention to the necessity for paid medical inspectors. 2. No text-books of hygiene should be put in the schools, because the masses do not get this education. The majority of children leave the schools before reaching the higher classes where this subject is taught. Hygiene should be impressed upon them by every feature of their environment.

Dr. Hibberd of Indiana agreed with Dr. Lindsley in the utter impossibility of teaching children in primary schools enough physiology to be of utility. There are many who are grandfathers who do not know what it is absolutely necessary to teach. Teach youth to observe, and what things they should observe. The trustees of schools understand the necessity for air, light, etc., but they cannot get the money to provide them. Every schoolhouse in the land should be situated so as to face the best direction of the compass, having air and light in abundance; but it will cost a great deal of money.

We must recognize that all children are not exactly alike in their capacity for receiving education; and the present methods are faulty in teaching all children on the same plan. Due regard must be paid to mental and physical variations, and sound minds and bodies cannot be had until this is recognized.

Dr. Hamilton, United States Marine Hospital Service, said that the reason that the majority of German children were myopic was due to the employment of the old black letter. German medical text-books are printed in Roman letters, but for political reasons the black letters are generally used. He believed in the necessity for school-inspectors; and the first thing they should do would be to examine the text-books, the paper of which is often inferior, and the printing but little better. Another feature demanding improvement is the sitting arrangement of a schoolroom. All know the country schoolroom, with its four rows of desks, and windows on either side of the room, which imperfectly light the middle rows of desks.

Dr. Vaughan of Michigan did not believe that all defects in eyesight in school-children are attributable to the schoolroom. If one enters any family room at night, the father and mother will be found sitting on either side of a table on which the light is, and the children are allowed to sit anywhere. More harm is done young girls by sitting up late at night at parties and dances than by all the alleged confinement in the schoolroom. Dr. Larrabee did not refer to the stairs, which are usually selected as one of the fertile sources of disease in young girls; but if one watches a woman go upstairs, she does it with her body bent forward, and swinging from side to side, instead of going upstairs erect. The German method of the climbing cure might be employed advantageously in some of these cases. In Michigan most children are better situated at the schoolhouse than at home; farmhouses, as a rule, from a sanitary point of view, being far from good. The ignorance of teachers on hygienic matters seems to me to be the primary evil.

Dr. Hibberd believed, with Dr. Vaughan, that the fundamental education should be with the teacher. But the architect must also be remembered. This gentleman usually puts his efforts on the adornment of the exterior of the building, and the interior is suited to this. One cannot get architects to give sufficient attention to the interior of these buildings, because it is their aim to produce handsome work.

Dr. Vaughan stated that the plans for school-buildings in Michigan must be approved by the State Board of Health.

ELECTRIC LIGHT AND EYES. — In the *Medical News*, Dr. George M. Gould discusses the question, "Is the electric light injurious to the eyes?" Before proceeding to the direct answer of this question, he refers to the relation of the electric light to general hygiene. Most every one, he says, has a general impression that the electric light is much superior to other methods of artificial illumination, so far as concerns our general health and comfort, but few could give a reason for the faith that is in them. They will come out of a theatre, music-hall, church, etc., with headaches, lassitude, exhaustion, their bodies bathed in sweat, all resulting in colds and a multitude of major and minor affections, and never utter a word of protest or complaint against the culpable and parsimonious management that permits the vitiation, poisoning, and superheating of the atmosphere by a thousand gas-jets. In the discussion of the question as to the injury to the eyes by the use of the electric light, Dr. Gould refers at length to the literature of the subject, and sums up the whole matter in the following conclusions: 1. As regards general hygiene, the superiority of the electric light over gas as an artificial illuminant is so overwhelming as to admit of no discussion. It is incontestably the light of the future, and the public should not rest until its meeting-places, such as theatres, halls, reading-rooms, churches, etc., are lighted by the most perfect system at its command. 2. A study of the published cases of injury of the eyes by the electric light shows that not one was due to the use of the diffused light as an illuminant. The popular prejudice against such a use of it is absolutely without justification. All the cases reported were of scientific investigators, etc., or workmen about the light, who approached it very closely, gazed at it protractedly, and without protecting colored spectacles. 3. The ocular injury is due, not to the supposed preponderance in the electric-light rays of violet and ultra-violet (chemical or actinic) waves, but simply to the greater number (intensity) of the usual length light-waves. 4. The symptoms of the ocular injury are possibly immediate temporary "retinal paralysis," blepharospasm, central scotomata, chromatopsia, after-images, etc. Within twenty-four hours there come on intense photophobia, lachrymation, ocular pain, a feeling as of foreign bodies beneath the lids, conjunctival hyperæmia and congestion, pericorneal circles, etc. 5. The attack usually lasts but two or three days; the prognosis is excellent; the treatment is simply cocaine and atropine instillations and cold or hot compresses. 6. Workmen and experimenters who must approach closely to the electric light should protect their eyes by smoked or tinted glasses, the depth of the tint being greater where the light is more brilliant, the proximity greater, or the exposure longer. In the welding-works the workmen must be particularly careful about this, and must also not expose the skin of the face, neck, and hands to the action of the light. The precaution may not be amiss to advise the curious against testing their eyes by gazing at the ordinary arc and glow lights at short range.

ELECTRICAL NEWS.

The Electric Sugar-Refining Process.

IN the last week the daily press, and the stockholders of the company organized to develop the electrical refining of sugar, have learned that the process does not exist, and that a gigantic fraud has been perpetrated. It is just to remark that many of the electro-technical papers have denounced the scheme from the first. With the Keely motor, it demonstrates the fact, that, by making large enough promises, a clever adventurer can get a great many people to advance money to promote the most impossible plans. There are few people who will not risk a few hundreds, or even thousands, on the promise of making a million in a short time. The refining process in question was secret from the first. Elaborate precautions were taken to avoid publicity, — a fact that should have at once aroused the suspicion of investors. A large sum of money ($250,000 to $350,000) was given the alleged inventor for the purpose of equipping a factory; and a few bags of raw sugar, taken to the works and submitted to the process, apparently came out as refined sugar. In reality this was effected in an extremely simple manner, by substituting previously provided refined sugar for the raw in the secret "electrical" chambers. The whole matter illustrates forcibly what we recently said about electrical investments, that while there are such investments which will give better returns than in almost any other industry, yet, like any thing else that is new and not well understood, it has been and still is the means by which a great deal of money has been obtained from trusting investors, from which there will never be any return.

THE ELECTRIC LIGHT IN LAND WARFARE. — The London *Electrician* describes the following experiments made on Hamp-

stead Heath, for the purpose of testing the capacity of small electric hand-lamps in searching for the wounded men left after a battle, and thus more rapidly than hitherto bringing the sufferers within the reach of surgical aid. The experiments were made by the officers and men of the London Division of the Volunteer Medical Staff Corps, — an organization which already consists of four efficient companies, largely composed of medical students, and for which a fifth company is now in process of formation. The corps, under Surgeon-Commander Norton, accompanied by ambulance-wagons, and provided with stretchers, halted upon one of the Heath roads at a time when the thick mists still hung heavily upon the lower grounds, and having established a field-hospital in a rather dreary-looking spot, poorly sheltered by bare trees, sent out its searching stretcher parties to pick up the bandsmen who had been distributed over the open ground at some distance off, to simulate the wounded left from a fight during the daylight. By the aid of the lamps thus brought into use for the first time, the men sought were found with comparative rapidity, the lights being sufficient also to enable the trained ambulance-men to apply preliminary bandaging upon the spot, and before loading the stretchers, which by other lights at the wagons were guided back to the road. There the men were carefully placed in the vehicles, and conveyed to the field-hospital, where the examining surgeons found very little to correct in the treatment adopted under such disadvantageous circumstances. The results achieved indicate sufficiently well, says the *Daily News*, that the electric light thus used would be of immense value, and tend greatly to reduce the suffering of men left upon the field at the close of a fight.

AN ELECTRIC ROAD FOR CHATTANOOGA. — There has been a very rapid extension of electric street-railroads during the year in all but the Southern States. Here only one very important road has been completed, although several are under contract. The street-car system of Richmond has been equipped with electric motors, and recently the Thomsom-Houston Company has opened a short road in Danville. The most important contract in the Southern States since the Richmond road was finished is that recently given by the Chattanooga Street Railway Company to the Sprague Motor Company. The line will be five miles long, and there are on it a number of sharp curves and heavy grades, the maximum being about eight per cent. The road will be newly constructed throughout. Eventually the entire railroad system of Chattanooga will be equipped with electric cars. The present road will have overhead conductors, a small wire fed from a larger wire, — the former over the track, the latter anywhere that is most convenient. The motor-cars will be of the new Sprague type, lately described in this journal.

THE EDISON LAMP PATENTS IN ENGLAND. — There will soon be given a very important decision on Edison's patents for incandescent electric lamps. In this country there has been no direct decision as to the validity of Edison's patents, all of the suits heretofore having been of a preliminary character; but in England and Germany several suits for infringement have been brought by the companies controlling Edison's patents in those countries, and the decisions, with one exception, have been in their favor. It is an appeal from this adverse decision that has just been argued. In the case, Edison's patent was declared invalid mainly because of incomplete specification, Justice Kay holding that a lamp as made by Edison's description was not commercially successful, nor could it be made so. Witnesses on the two sides attempted to make lamps according to the specifications; and those called by the Edison Company succeeded in doing so, while those on the other side uniformly failed. Finally Professor Stokes was appointed as referee, and a number of lamps were made and were tested. Some of these gave out in a few hours, others burned longer. The results obtained would not be in any way satisfactory as compared with our present lamps, nor could a station using these first lamps be run at a cost to make such an enterprise practicable. Professor Stokes reported impartially the result of the experiments, which at the time were generally considered as favoring the Edison patents. Justice Kay decided, however, that the lamps described in the specification never became, nor could ever become, a commercial success. The case on appeal is now before the same court that formerly affirmed the validity of the patents, and there seem to be strong hopes among those interested that the present decision will be like the former one. The decision of Justice Kay had a beneficial effect on the lamp-trade in England: prices have been reduced, and several firms have put new and improved lamps on the market. At the same time, if Edison is the original inventor of incandescent-lamp filaments, he should be entitled to the benefits of his invention. While the sustaining of a fundamental patent in any industry has a tendency to create a monopoly for a number of years, and restrict competition and decrease the rapidity of progress, yet the ill effect of a failure to sustain a just patent would have the still worse effect of discouraging invention. In the case of Justice Kay's decision on the Edison patents, the fact that the lamps made would not pay to manufacture commercially should have no weight, provided they first embodied the principle on which the present lamps are made; the only changes being in the improved methods and materials taught by experience, these improvements being merely in matters of detail.

THE DAFT MOTOR ON THE ELEVATED ROADS. — The Daft Electric Company continue their experiments with the large motor and trains of cars on the Ninth Avenue Elevated Railway in this city. Some weeks ago a train of eight cars was taken up a grade of nearly two per cent at a speed of seven miles and a half an hour. On several occasions a speed of thirty miles an hour, with three cars, has been reached. The regular train speed on the Ninth Avenue road is thirteen miles an hour, but with the electric motor no difficulty is found in maintaining a speed of fifteen miles an hour. A *Science* representative was one of a party, a few evenings ago, who were carried over the road from Fourteenth to Fiftieth Street at a speed approaching twenty miles an hour. The motion was smooth and easy, and there was nothing but the entire absence of smoke, smell, and cinders to indicate that the train was not drawn by an ordinary locomotive.

NOTES AND NEWS.

WE wish again to call attention to the monument for Audubon which it is proposed to erect over the place where he is buried. The authorities of Trinity Cemetery have changed the plot, and placed the remains in a well-constructed vault in one of the most conspicuous parts of the cemetery, and the committee in charge of the matter are anxious to have the monument erected as soon as the funds will justify it. Subscriptions are coming in very slowly. The committee have decided to distribute to each subscriber to the funds a copy of a portrait of Audubon which was painted by Cruikshank and engraved by Turnure. As this engraving is a copy of a very valuable and rare one, the committee hope that this will be an inducement to persons to subscribe.

— The American Society of Naturalists held in Baltimore, Dec. 27 and 28, one of its largest and most successful meetings. Methods of instructing large classes in botany were presented by Professors Goodale and Wilson, and in geology by Professors Niles and Williams. The society fully approved the excellent work of its committee on education, in paving the way for better instruction in the natural sciences in all grades of schools, especially the lower ones. Mr. J. E. Wolff showed a photographic method of class illustration, and Professor W. M. Davis explained a most interesting series of paper models, illustrating the development of certain topographic forms and their relation to base-levels of erosion. The society is composed largely of teachers, and desires to so arrange its meeting next year that the members may be able to attend the meetings of specialists held about the same time.