in the fall, he drew up a careful report, which was printed, and may be had on application. The organization of the "local centres," as they are called, was at once actively entered upon.

In organizing these local centres, the society endeavors to cooperate with, and as far as possible work through, existing institutions. In almost every case we have found some organization which possessed a hall, and was willing to take up the work, and to grant the use of the hall rent-free. The first centre established was that at Roxborough, in connection with the St. Timothy's Workingmen's Club and Institute. They opened their first course on chemistry on the 3d of November, 1890.

The following is a list of the centres that have been established, and the courses in progress at the same: Wagner Institute, zoölogy, chemistry, geology, psychology, and two courses in English literature; Association Local Centre, in connection with the main branch of the Young Men's Christian Association, astronomy, biology, higher mathematics, and two courses in English literature; West Philadelphia, American history and English literature; Frankford, American history and English literature; Holmesburg, American history and English literature; Germantown, English literature and electricity; Spring Garden, mathematics and two courses in English literature; Wissahickon Heights, English literature and European history; South Broad Street, American history and electricity; Women's Christian Association, biology; United Club and Institute, English literature; Norristown, two courses in English literature; Camden, N.J., English literature; Lansdowne, electricity; Media, English literature; Haddonfield, N J., European history; Newark, Del , English literature; Mount Holly, N.J., American history; Downingtown, Penn , English literature; Trenton, N.J., English literature; Wilmington, Del., English literature.

To summarize what has been done thus far, there have been forty courses, with an average attendance of 9,250 (estimated), and two hundred and fifty lectures, with a total attendance of 55,500 (estimated).

Applications for the formation of local centres have also been received from Salem, N.J.; Bryn Mawr, Penn.; Reading, Penn.; Bristol, Penn.; Gloucester, N.J.; Woodbury, N.J.; Woodbourne, Penn.; Williamsport, Penn.; Wilkesbarre, Penn.; West Chester, Penn.; Lebanon, Penn.; Towanda, Penn.; Collegeville, Penn.; Rahway, N.J.; Doylestown, Penn.; Hazleton, Penn.; Lancaster, Penn.; Bridgeton, N.J ; Pottstown, Penn; North Wales, Penn.; and Staten Island, N.Y.

The courses vary in length from six to twelve lectures. The method adopted is, first, to have the lectures last about an hour, after which the students form themselves into a class to pursue the subject further. In connection with each course there is issued a syllabus, giving a full outline of the lectures, together with suggested lines for collateral reading. In addition to this, it also contains at the end of each lecture a series of exercises, which the student prepares at home and mails to the lecturer, who returns them at the following class with his comments noted on the margin. At the end of each course an examination is held, upon the basis of which, together with the weekly paper work, certificates are awarded.

This short statement gives the public a fair idea of our general work as we have entered upon it and carried it out. It is hoped that general interest will be felt in this plain statement of facts regarding a novel attempt at higher education with its surprisingly successful results. We desire also to state what is our main aim in this university extension work. It has been too long the system to keep university forces, teaching, and methods shut up entirely within classrooms, and to leave the great mass of people without the opportunities of having their minds fertilized with great thoughts, their studies carefully guided, and their knowledge lifted from a lower to a higher plane by this systematic university teaching; for it must be noted especially that the teaching contemplated in this movement is of real university grade, conducted by teachers of the first rank, and by methods which have proved themselves capable of giving results fairly comparable with those obtained within academic halls.

We propose, then, to carry this university work out into the general community as far as practicable. It will afford to all, however pressed with practical duties, or hindered by lack of funds, the opportunity of acquiring recent and exact knowledge, and of sharing in the stimulating discipline of genuine educational methods. These methods adopted by the society are flexible, and well adapted to the objects in view.

The society aims to make its local centres self-supporting. With proper efforts at each centre, this can usually be accomplished; but it is evident, that despite this, and despite the generous cooperation of many eminent teachers, large expenditures of money will be required.

We are happy to announce that the continuance of the work is secured by a liberal guaranty fund for five years. It is, however, believed that all will recognize this new national educational movement as judicious as well as generous, and that its claims will appeal forcibly to very many minds. It is earnestly hoped that all who realize its importance will become members of the society, and assist in the development of the work.

MICHIGAN STATE SANITATION.

THE annual meeting of the Michigan State Board of Health was held April 14 1891. Professor Fall, Drs. Avery, Hazlewood, Vaughan, and Baker, were present. Dr. Avery was re-elected president. Dr. Vaughan reported that at the State Laboratory of Hygiene he has made analyses of all the different kinds of baking-powder found in the market, also of one hundred and twelve samples of water from different parts of the State, and that he was ready to report the results, also of his researches on typhoid-fever. Dr. Baker reported that he had worked out the cause of influenza. He said its greatly increased prevalence during the last three months is alarming, because so many other diseases follow that disease, and increase after it increases; the diseases which so increase being consumption, pneumonia, cerebro-spinal meningitis, rheumatism, osteo-myelitis, etc., influenza seeming to bring in its train all of these most important diseases. Dr Baker explained the causation of influenza. He stated that the germs of influenza are generally at all times present, and the germs of pneumonia, tuberculosis, and of the other specific diseases are somewhat widely disseminated, but that there must be certain coincident meteorological conditions to irritate the throat and air-passages sufficiently to let the germs gain an entrance to the body. These meteorological conditions, in this instance, were the excessive prevalence of north and north-east winds, and the excessive amount of ozone during the past three months. The prevention of influenza, and of the coincident rise in the other more dangerous diseases, has not been possible, because of ignorance of the causes. Now the causes are known, and the study of the measures for the prevention can begin. How to get more thorough disinfection after contagious diseases, was brought up by Dr. Hazlewood, also by letter from Dr. Nicholson of the Upper Peninsula, and also by other correspondence of the office of the board It seems to be made plain, that, if the bill now before the Legislature (Senate Bill 257, House Bill 640) shall become a law, making a small appropriation to enable the State Board of Health to send an inspector to the localities where most needed, to aid in the final disinfection after cases of dangerous diseases, the spread of those diseases can be very greatly lessened, and hundreds, and possibly thousands, of lives can be saved in Michigan in every year.

PORCELAIN INDUSTRY IN FRANCE.

THE United States consul at Limoges says, in his last report to the United States Government, that the proprietors of the large porcelain-factories there have been for a long time studying the question of reducing the price of fuel. At a recent congress of the manufacturers, it was said that some new and cheap way of manufacturing porcelain must be found for France, or the industry which has become so famous, and which employs so many of the inhabitants, would be driven from French soil on account of the cost of firing. It was there ascertained that the cost of firing china in Bohemia was not more than 10 francs a ton; in England it was only 13 francs; while, for the same thing in France, at Limoges, the cost was between 34 and 35 francs. This difference

being so great, and making it impossible for the French manufacturers to make their china as cheaply as their foreign neighbors, various devices have been tried, but with little success. In order to compete, wages have been reduced to the lowest point, and still the manufacturers are said to have lost money. The coal that is employed is necessarily costly, as a smokeless, long-flame variety is required. Many of the factories burn wood only, as that produces a purer white than the very best kinds of coal; but wood is dearer than coal. It is consequently only used in firing the muffles, and in the finest grades of porcelain. A few years ago a new process was tried, that baked the porcelain in a short time; but the cost made the process impracticable. It was under such circumstances as these that one of the most progressive houses in Limoges was induced to employ petroleum or residuum oils as a fuel, to accomplish which, an American firm using the Wright burner was requested to make a trial with the fuel. There was very much doubt and fear connected with the experiment; but after a time it was attempted, and the results were far better than anticipated. The heat was shown to be absolutely pure. No gases or smoke in any way discolored the china, which came from the kiln much whiter, and in better condition, than when it is fired with the best of wood. In the muffles there was a decided advantage. The delicate colors, which show at once the presence of the slightest quantity of gas, were perfect. "This new discovery," says Consul Griffin, "promises to revolutionize the whole porcelain industry." It is estimated, that, by employing these oils, there will be a reduction of about 15 or 20 per cent in the making of china. The only question now is the present classification of residuum oils in the customs tariff, as the present duty on petroleum — 120 francs per ton — is prohibitive; but strong pressure is being brought to bear on the French Government to have fuel oils classified as fuel, which pays only 1 franc 30 centimes a ton. New life is given to an industry that was seriously threatened; and it is hoped that the French porcelain will be brought to a greater state of perfection by this new American invention.

MEXICAN ARCHÆOLOGY.

MR. CARL LUMHOLTZ writes, "Since I wrote last, I have had an interesting though sometimes rather rough time of it, crossing Sierra Madre in December and January. We had snow several times, and the grass is of poor quality, so I lost altogether thirteen of my animals. There are three Sierras to cross at an elevation of about nine thousand feet: you may therefore easily imagine what a rough country it is to traverse in the winter-time, making our own trails. I had thirty men and about a hundred animals, and I pulled through all right. My camp is now near Casas Grandes in Chihuahua, where my animals are resting. The scientific result is very satisfactory so far. The most interesting things I came across were some wonderfully well-preserved skeletons in a series of caves. In some of the caves were small villages; others were reserved as burial-places, and here I dug out several of the above-mentioned skeletons, the porphyry pulp having preserved for centuries the corpses so well as to be made into some kind of mummies. The features on some are complete, even hair and eyebrows still there. These people were of small stature, and bear a striking resemblance to the Moqui Indians of the present day. In the eastern slopes of Sierra Madre I also dug out many mounds, and every day brought to light fine stone implements and beautiful pottery. I might profitably spend two years in excavating mounds only; but I am going on with this kind of work only till the end of April, when I start out again in the mountains. Among the fossils found on the western slopes of Sierra Madre, near Nacory, is a huge horn six feet eight inches long and twenty-six inches at the largest circumference, probably belonging to some extinct bison. Many birds and plants (about two thousand) were found. I am entirely confident of the success of the expedition. Next time you will hear that I have found people alive in the caves. There is a wonderfully rich field before me, and I know that my expedition will bring greater results than anybody at present anticipates. But the expenses are far greater than I expected. My animals only cost three thousand dollars. In December and January I paid wages each month, respectively, $1,000 and $1,025. I mean to reduce my force; but a small party cannot well travel here, as there are plenty of Apaches, and farther south any amount of bandits that are equally bad. I now have a fine gang of men and every thing in regard to outfit complete, speak Spanish fairly well, am on excellent terms with the Mexican Government (they imprisoned lately for three years an inspector who stopped my provisions last fall), and the field before me is of exciting interest. But more material support will be needed, if I shall not have to go just with two or three men. Still, I am determined to do even that, because I must accomplish my aim. I am now on a fortnight's trip to the United States to see some friends that I think may give me further support, and on the 26th or 28th of April I expect to be on the march again."

HEALTH MATTERS.

Influence of Exercise on Digestion.

DR. STRENG, in a lecture before the Medical Society of Giessen, on "The Influence of Exercise on Digestion," an abstract of which appeared in the *Lancet* for March 7, states that he concludes from his own experiments that this influence is of a retarding nature. His experiments, however, suffer from the fact that he always injected 300 cubic centimetres of water before obtaining the contents of the stomach, so that the proportion between gastric juice and water continually varied. The first experiments in the clinic at Giessen were made on two dogs. Twenty-five grams of meat suspended in 300 cubic centimetres of warm water were twice injected into the fasting stomach; and after one feeding, the dogs were compelled to remain for three hours in absolute bodily rest, while after the other feeding they were made to take active exercise. After the three hours, the contents of the stomach were obtained and analyzed. The quantity did not essentially differ in the two cases: the experiments consequently tended to prove that exercise does not influence the time required for digestion. The chemical analysis also detected no difference. The same results were obtained by substituting the white of an egg for the meat. The experiments were then repeated twenty-five times on three men with healthy stomachs. Two of these suffered from sycosis, and the third from insipient muscular atrophy. They were fed each time with 200 grams of minced meat, a bun, a plate of bouillon, and three spoonfuls of mashed potatoes, and the contents of their stomachs were obtained four hours and a half afterwards. The exercise after meals consisted partly in gymnastics, partly in walking. Absolute rest was obtained in bed. These experiments gave the same results as those on the dogs, the difference resulting from the chemical analysis being especially imperceptible. The author therefore concludes that the gastric function is in no way influenced either by muscular action or by absolute rest.

LETTERS TO THE EDITOR.

*** Correspondents are requested to be as brief as possible. The writer's name is in all cases required as proof of good faith.*

The editor will be glad to publish any queries consonant with the character of the journal.

On request, twenty copies of the number containing his communication will be furnished free to any correspondent.

The Pollination of Zea Mays.

THE brief report, in *Science* of March 27, of the interesting experiments with American corn at Cornell University does not give the results of the control tests, and thus fails to prove that removing a number of the tassels from a corn-field increases the yield of the emasculated stalks. The standard given for comparison is the yield of certain stalks under abnormal conditions.

The experiments of Darwin, Gaertner, and others, make it probable that the fertilization of a monœcious organism with the male element of another individual of the same species increases the vigor of the progeny, and, conversely, that self-fertilization either results in sterility or a weakened progeny.

Applying this biological law to the corn-field in question, it might be claimed that the stalks which were allowed to tassel were self-fertilized to an abnormal degree, and thus were weak-