The antiquities of the country do not consist of such great pyramids as those of Xochicalco, or the palace of Palenque, but they possess a peculiar style of their own, and afford important material for reconstructing the ancient history of Mexico. They are difficult to find, for since the days of Cortes the primeval forest has completely covered and buried them. The houses of the ancient inhabitants stood upon raised foundations, consisting of small pyramids of regularly hewn stones. Among these heaps of stones the largest trees of the virgin forest have expanded, and separated the stones from one another. During the construction of railways, a large number of these pyramids were opened; and in this way a quantity of household furniture has been found, especially painted pottery, and statuettes of beautiful forms, and made of excellent material. The tropical rains also bring to light many objects of the same kind.

Dr. Seler then visited the territory of the Zapotecas, in the state of Oaxaca. The condition of this region is considerably more advanced than that of the country of the Huaxteca. The land is richer and better cultivated, the villages better built. Intellectually it is the most advanced state of the republic. The numerous valleys which cut into the high lands, and the numerous rivers which have to be crossed, present special difficulties to the development of trade and commerce. In many cases the river-bed itself forms the road; and in the rainy season, from August to October, intercourse is often interrupted for months at a time.

The territory of the Zapotecas is the land of mounds and bastions. These have partly served as fortifications, partly as tombs, many of which remain to be opened, for the law which prohibits the exportation of antiquities is only too well calculated to discourage explorers. Here Dr. Seler discovered numerous inscriptions and important paintings which had escaped the notice of former observers. The hieroglyphics discovered on the national sanctuaries of the Zapotecas may, should they be completely deciphered, afford a key to the proper understanding of the connection between the Maya and Aztec civilizations.

HEALTH MATTERS.

Baking-Powders.

PROFESSOR J. W. MALLETT of the University of Virginia has recently made a series of experiments with alum baking-powders, and studied effects upon digestion of the residues left therefrom in bread. A full report has been published in the *Chemical News*. He says that it has been almost universally conceded that alum itself, when added singly to bread or other food, is positively injurious to health; and that its use, even in the small proportion sometimes employed to improve the appearance of bread made from unsound or inferior flour, must be regarded as reprehensible. But since the extensive introduction, in the United States, of baking-powders made with alum and bicarbonate of soda, there has been much dispute as to the harmlessness or harmfulness of the substances which are left in bread made with such powders after the mutual re-action of their constituents and the completion of the baking process.

It has been claimed, by those who advocate the use of cheap baking-powders made with alum as one of the ingredients, that as soon as the mixture of alum (usually first deprived, by heating, of the whole or much the greater part of its water of crystallization, — so-called "burnt alum") and bicarbonate of soda is moistened, as in working it up with flour to form dough, the aluminum sulphate is decomposed, sodium sulphate being formed, with which there also remains sulphate of ammonium or potassium, as ammonia or potash alum has been used; and the aluminum assumes the form of aluminum hydroxide, insoluble in water, and therefore supposed to be inert and harmless in the stomach and alimentary canal. It has been noticed that the aluminum is also partly converted into phosphate in presence of the phosphates naturally occurring in flour, and this has been also taken to be insoluble and inert. It has been further claimed, that, at the temperature of the baking-oven, aluminum hydroxide is itself decomposed, water being given off, and the highly insoluble aluminum oxide, or alumina, left behind, to be discharged from the intestines as might be so much clay or other harmless and indifferent matter.

On the other hand, it has been asserted, by some of those who oppose the use of alum in baking-powders, that the decomposition is not, or may not be, complete, and in any case, that, as all of the constituents of the alum remain in the bread, the action upon the human system must be essentially the same as if the alum itself remained intact.

In the discussion of the effects on health of the residual substances left in bread made with alum baking-powders, there has been a good deal of loose argument, based upon data which were either merely assumed as probable, or were too imperfectly supported by actual experiment. In such experiments as have been hitherto recorded, bearing directly on the question, there are many points left in an indeterminate state, and calling for further investigation in order to clear them up and admit of an impartial conclusion being reached. The work undertaken by Professor Mallett was with a view to furnish some more exact and satisfactory evidence of the kind required for the purpose of reaching such a conclusion.

In the examination, twenty-seven samples, representing seventeen brands, were analyzed. Nearly all contained as their acid ingredient a mixture of alum and acid phosphate of calcium ("superphosphate"). All contained as the alkaline ingredient acid carbonate of sodium ("bicarbonate of soda"). After a most thorough and painstaking inquiry into the whole subject, he reached the following conclusions: 1. The greater part of the alum baking-powders in the American market are made with alum, the acid phosphate of calcium, bicarbonate of sodium, and starch; 2. These powders, as found in retail trade, give off very different proportions of carbonic-acid gas, and therefore require to be used in different proportion with the same quantity of flour, some of the inferior powders in largely increased amount to produce the requisite porosity in bread; 3. In these powders there is generally present an excess of the alkaline ingredient, but this excess varies in amount, and there is sometimes found, on the contrary, an excess of acid material; 4. On moistening with water, these powders, even when containing an excess of alkaline material, yield small quantities of aluminum and calcium in a soluble condition; 5. As a consequence of the common employment of calcium acid phosphate along with alum in the manufacture of baking-powders, these, after use in bread-making, leave, at any rate, most of their aluminum in the form of phosphate (when alum alone is used, the phosphate is replaced by hydroxide); 6. The temperature to which the interior of bread is exposed in baking does not exceed 212° F.; 7. At the temperature of 212° F., neither the "water of combination" of aluminum hydroxide, nor the whole of the associated water of either this or the phosphate, is removed in baking bread containing these substances as residues from baking-powder; 8. In doses not very greatly exceeding such quantities as may be derived from bread as commonly used, aluminum hydroxide and phosphate produce, or produced in experiments upon himself, an inhibitory effect upon gastric digestion; 9. This effect is probably a consequence of the fact that a part of the aluminum unites with the acid of the gastric juice, and is taken up into solution, while at the same time the remainder of the aluminum hydroxide or phosphate throws down in insoluble form the organic substance constituting the peptic ferment; 10. Partial precipitation in insoluble form, of some of the organic matter of food, may probably also be brought about by the presence of the aluminum compounds in question; 11. From the general nature of the results obtained, the conclusion may fairly be deduced, that not only alum itself, but the residues which its use in baking-powder leaves in bread, cannot be viewed as harmless, but must be ranked as objectionable, and should be avoided when the object aimed at is the production of wholesome bread.

QUARANTINE CONFERENCE. — The recent quarantine conference which convened at Montgomery, Ala., discussed most thoroughly the question of yellow-fever in all its aspects. As it was composed of the most experienced sanitarians of the country, many of whom have been repeatedly engaged in fighting yellow-fever epidemics, the conclusions of their deliberations are entitled to great respect and consideration. The method of disinfection as practised at the New Orleans station, by the use of superheated steam in steel cylinders under pressure, was indorsed as being the best

method known to science. The surgeon-general of the Marine Hospital service (who was present) was requested and promised to erect at Tampa, Fla., a similar plant. The administration of marine quarantine, as now carried out by the surgeon-general, was especially commended, and the request was made that more stations and more men be devoted by him to this work. The co-operation of the management of the Plant Line of steamers, plying between Havana and Tampa, with Dr. Burgess, United States medical inspector at Havana, was commended as an example for cleanliness of ships, scrutiny of passengers, and disinfection of baggage. By special resolution, the attention of the secretary of the treasury of the United States was called to the prevalence of smuggling between Cuba and the Florida coast, and the great danger of introduction of yellow-fever by this illicit traffic; and he was requested to use additional precautions, and, if possible, put a stop to it. On the question of inland quarantine it was decided, that, as far as possible, this should always be declared, where they exist, by State boards of health; and that by whomsoever declared, within thirty-six hours after the proclamation, comfortable quarters, with provisions and bedding, must be provided for the unfortunates detained at the station. The conference, by a decided vote, refused to indorse the proposition that it was necessary to disinfect a town or city in which yellow-fever had prevailed, but in which there had been no cases for several months, and the place had been subjected to the frosts and freezes of winter; deeming that the use of disinfectants under these circumstances was not only useless, but tended to breed unnecessary terror and distrust not only among the people of the place, but of surrounding States.

TREATMENT OF OBESITY. — Dr. W. T. Smith communicates to the *British Medical Journal* a method for the treatment of obesity which he has successfully employed in forty-three cases, including himself. The plan which he follows is to confine the diet to rump-steak, cod-fish, and hot water for fourteen days, with the absolute exclusion of every thing else. Taking meat in large quantities may lead to dyspepsia, but this can be easily overcome by reducing the meat to an essence. This may be done as follows: Take four pounds of beef free from skin and fat; cut it to pieces about an inch square; place the meat in a close-fitting, air-tight jar; stand the jar in a pan of boiling water, and let it simmer for six hours. Pass the juice of the meat thus obtained through a sieve; then measure four ounces of the fibrine of the meat; pulverize it in a mortar, and stir it up with the essence; divide this into four doses, and you will obtain the nitrogenous elements required of the quantity of meat to be taken at one meal. There is also a similar way of obtaining meat-essence by using a pot called "Boule Américaine." In treating his cases, in several instances he has been obliged to modify the amount of hot water, and lessen occasionally the quantity of meat; but as regards his own personal experience, he found that three pounds of rump-steak and one pound of cod-fish were hardly sufficient to satisfy his appetite. The meat diet and hot water alone must be regularly adhered to for fourteen days; and the amount of hot water taken at any time during the day, commencing at seven in the morning and finishing at half-past ten at night, varies from six and one-third pints, more or less, according to the powers of the patient. The second epoch of twenty-one days the diet may be considerably varied, as he reduces the hot water to four pints in the twenty-four hours; and he allows other kinds of meat, such as mutton-chops free from fat, and chicken; and, as regards fish, grilled turbot, whiting, or soles; a little green vegetable, and some slices of plain unsweetened rusk. The third epoch, thirty-one days, the hot water is reduced to about a quart a day, and he allows tea, stale bottom crust of household loaf, captain's biscuits, grilled fish, fowl, game, turkey, any joint, hock or claret, with seltzer-water, in place of whiskey. As hot water is very unpalatable, a slice of lemon may be added to each tumbler. No case of obesity should be treated by this method when the patient is suffering from any organic disease, unless it be some trifling malady. The loss of weight in nearly all cases will vary somewhat; but Dr. Smith states that his patients bear the treatment exceedingly well, and express themselves as feeling far better in health, and able to take exercise with comfort. The first period of fourteen days is really the only hardship, and he has found very little difficulty in persuading patients to stick to the diet. As some alkali is essential, he prescribes five grains of the bicarbonate of potassium, to be taken night and morning. Dr. Smith offers to send his diet-cards to any medical practitioner who will write to him, but asking that the result of any case put under treatment be reported to him.

ELECTRICAL NEWS.

The Clark Cell as a Source of Standard Currents.

FOR measuring small currents, there are two methods which should give good results. The first is by the use of an electro-dynamometer, where the mutual actions of circuits carrying the current are balanced by known weights. In this instrument the changes in the magnetic field do not affect the results; and but for its inconvenience, and the fact that continuous readings are impossible, electro-dynamometers would be universally used. In the second method an ordinary galvanometer of any convenient pattern could be employed, provided it could be easily calibrated in order to eliminate errors due to changes in the earth's field or to the field due to magnets on the instrument itself. In order to effect this calibration, Messrs. Threlfall and Pollock have endeavored to obtain a galvanic cell whose electro-motive force will remain constant; and, by sending a current from this through a known resistance, the value of the current is known, and it can be used to standardize a galvanometer meter. In the form of instrument chosen, a movable coil was employed, with an adjustable directing magnet. To calibrate it, the coil was moved to a marked position, a current from the standard cell was sent through it, and the directing magnet moved up or down until the deflection reached a certain set value. This can be easily and rapidly done.

The standard cell was of the Clark type, now almost universally used for comparisons of electro-motive force. From the ordinary type, only an extremely small current can be taken, or the electro-motive force will drop and the cell be ruined. In the type devised by Messrs. Threlfall and Pollock, a much larger surface than ordinarily used was employed. In a paper read before the London Physical Society the gentlemen named give the result of a long series of experiments on these cells. The conclusions at which they arrive are as follows: —

1. When a current is taken from a Clark cell, the terminal electro-motive force drops practically instantaneously to within an inappreciable amount of its final value. 2. To the first degree of approximation, this value is constant. 3. There is no appreciable secular change. 4. When the current is stopped, the terminal electro-motive force rises instantly to within a few thousandths of a volt of the original value. 5. The cell completely recovers in time. 6. The above statements are only true when the current does not exceed a certain value, depending on the size of the cell. For a cell in which the zinc and mercury surfaces have each a value of five inches or upward, .001 of an ampère will not be too great; for the ordinary cell used as a standard of electro-motive force, the current should not exceed one hundredth of this value. 7. When too large a current is taken from any cell, the electro-motive force goes on dropping for some time, after which it rises slightly, and seems to tend toward a fixed value.

THE DETROIT SECONDARY BATTERY. — One of the new secondary batteries which has been attracting considerable attention during the past few months is the Detroit battery, manufactured by the Woodward Electric Company of Detroit, Mich. It is of the Faure type, with a support-plate of lead and active material consisting of salts of lead in cavities in the support. The method of making the support-plate is decidedly novel. Rock salt is put into a square mould, and is baked. Melted lead is then run into the mould and allowed to solidify. The cube thus formed is sawed into plates, and the salt is dissolved out of them by putting in warm water. The result is a plate full of cavities of irregular shapes, having in general an overlapping portion, which prevents the active material from falling out. A solid rim with a lug for a terminal is cast around this central porous portion, and then red lead or litharge is pasted into the cavities. The plates are then put in a cell containing sulphuric acid, and formed by sending a current of electricity from the positive to the negative set. The Detroit batteries have