INVENTOR TESLA'S LOSS.

By a fire which occurred at 33 and 35 South Fifth Avenue, New York City, on the morning of March 13, Nikola Tesla, the inventor and scientist, sustained a severe loss in the total destruction of his laboratory, in which were several nearly completed inventions which, it is said, were intended to revolutionize electric lighting. The loss cannot unfortunately be reckoned in dollars, and it is feared may seriously affect Mr. Tesla's health, as for some time he has been in a state of nervousness bordering on exhaustion, on account of overwork occasioned by the approach to completion of some of his great inventions.

Dr. Tesla was for a time associated with Edison. The attention of the scientific world first centered upon Tesla in 1887 through his invention of the rotating magnetic field for the economic transmission of power. It is believed that Mr. Tesla's experiments were made with a view to saving at least one-third of the energy now wasted in electric lighting. He has been working in his laboratory with a number of assistants, and the results which he has actually obtained have been kept a profound secret. Mr. Tesla has lectured before scientific bodies, both in Europe and America, and he has recently received honorary degrees from Yale and Columbia Colleges. He is at present controlling electrical engineer of the Niagara Falls Power Company. Some of Mr. Tesla's remarkable experiments have been reproduced lately in Berlin. The Illustrirte Zeitung of recent date gives an engraving, which we copy, together with the following account:

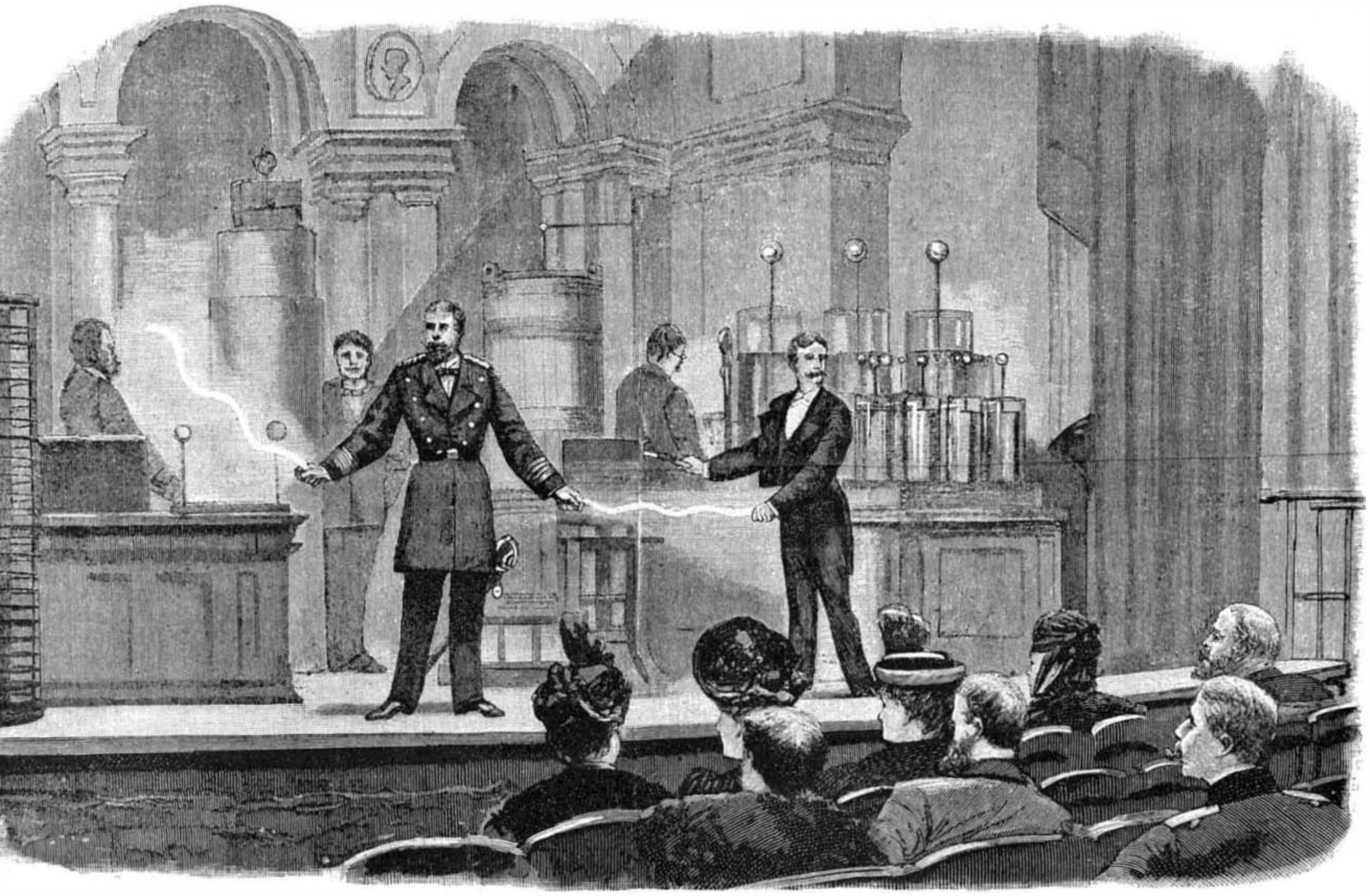
"About twenty years have passed since Edison produced the incandescent lamps under the proud name of the 'light of the future,' and which lamps slightly modified are now the 'light of to-day.'

"A new 'light of the future,' is again promised from the United States, and should it materialize in practical form will have the great advantage over the incandescent and arc lamps that for its production no conducting wires are required, and which for this reason alone would be sufficient to produce a complete revolution in the electrical world.

"Nikola Tesla, the inventor of the new light, obtained by his experiments surprising results. In following up certain discoveries of Prof. Herz, of Bonn, relative to electrical waves, he succeeded in lighting a freely suspended incandescent lamp by the use of high tension and rapidly alternating currents.

"The experiments further demonstrated the remarkable fact that alternating currents of a tension ten times that which is used in electro-execution do not affect or injure the human body when passed through the same; and in fact are hardly perceptible in case the currents alternate 100,000 times in a second, that is, change their direction at this almost incomprehensible velocity.

"Several of the experiments were made at the last annual meeting of scientists in Vienna, but through Prof. Spies, one of the members of the Berlin 'Urania,' the experiments were made publicly, and were attended by the German Emperor's brother, Prince Henry, who, as the cut shows, served as a conductor for the high voltage currents. By reference to the illustration, it will be seen that the connection between two persons is made by Geissler tubes, which show the light produced by the currents. In another experiment a number of connected wires were arranged in the auditorium and connected with the electric current, whereby an electrical wave was produced in the room, and noticed by some of the audience through the lighting of Geissler tubes held in their hands, and without these persons being in direct connection with the wires."



RECENT TESLA EXPERIMENTS IN BERLIN.

The Loss of the Elbe.

At the recent inquest upon the bodies landed at Lowestoft of the victims of the Elbe disaster, Robert William Greenham, pilot, stated what took place on board the Elbe after the collision. He said he had crossed the North Sea about 400 times, and had been on board the Elbe about one-tenth of the trips. At 12 o'clock midnight on January 29 the atmosphere was clear, but the sky was cloudy. The Elbe was lighted by electricity, which was kept burning all night. The masthead light and the side lights, however, were oil. He went to his cabin at midnight, undressed and went to sleep. At 5 o'clock he looked at his watch, which showed English time, and about 20 minutes afterward he heard a crash as if a cylinder had burst, and thought the engines had broken down. He got out of his bunk, put on some clothes and went to the bridge, where the captain and the chief officer were standing. He asked the captain what had occurred and he replied, "A collision has taken place." One of the officers remarked that they had been run into by a steamer on the port side. He observed the ship make a slight list to port, and the captain then ordered that rockets should be fired and blue lights burnt, and that the steam siren should be blown. One of the officers then came up and reported all the watertight doors closed. The ship made a further list to port, and the captain ordered the engines half speed ahead, with the helm put hard to starboard, the engines having been stopped at the time when the witness went on the bridge, and the wind being strong from the east-southeast. By this maneuver it was sometimes possible to give the vessel a list to starboard and bring the damaged portion high out of the water. The engines went for about four minutes and then stopped. The captain then gave the order to get all the boats ready and swing them out, but not to lower them. There were ten boats on board, five on each side. The witness left the bridge in company with the chief officer in order to assist in getting the boats ready. He proceeded to No. 3 boat, and as soon as the covers were sufficiently removed for the crew to get at the boats they used axes to free them, as everything was frozen stiff. The order was then given to every man on deck, "Let all the crew remain at their stations." The women and children were ordered to the starboard side, which was the lee side, in order that they might be got into the boats first. There was no confusion on board, and every order was obeyed punctually. Everything was in total darkness at this time, as the electric light had gone out. The lights had been turned on to the promenade deck to give light to launch the boats. The third officer informed him that as all the watertight compartments were closed it was impossible for the ship to sink. Both No. 3 and No. 5 boat, which were the next to be got out, were pretty well filled with people. It was too dark to see whether they were passengers or sailors. The ship settled down very quickly, and the witness went up to the bridge and warned the captain that the water was already breaking over the quarterdeck. He returned shortly to No. 3 boat and heard the order given to lower the boats. No. 5 boat was lowered and swamped as soon as she touched the water. He jumped into No. 3 boat and the third officer followed. The boat was immediately lowered. He saw a green light about three points abaft the port beam, some three miles away, while he was standing on deck. He also saw a white stern light apparently on the same vessel. At daybreak, which was in about three-quarters of an hour, he observed the hull of the vessel with the two lights aboard her. He could not see her masthead lights. The vessel steamed ahead, burnt two lights, which he took to be blue lights, put her helm hard a-starboard, and, proceeding in a southerly direction, shortly afterward disappeared. He took some paper from his pocket just before the steamer turned her head and burnt it in order to attract her attention. He made the observation that he believed it was the steamer which had run into them. There was also a smack in the vicinity. The steamer was about two points on their starboard bow to windward, and the smack was on the starboard beam. The steamer was from half to three-quarters of a mile away and the smack about one mile. He saw several smacks' lights in the vicinity, but none close by. He saw the lights quite distinctly, as they could see a light that night directly it came out of the water.

The lights of the Elbe were burning when he got on deck. He was positive that the steam siren was continually sounded and that a quantity of rockets were discharged, in addition to the burning of 20 blue lights in pairs.

The witness gave his opinion that the ship probably sank because two watertight compartments were knocked into one. He could not say whether the Elbe ever had boat drills on board. He had never seen such drills when on the North Sea.

Clay Eating.

Among the extraordinary passions for eating uncommon things must be reckoned that which some peoples exhibit for eating earth or clay. Of this practice, which would appear to have once prevailed all over the world, numerous examples were cited by Captain J. G. Bourke, U. S. A., in the Ninth Annual Report of the Bureau of Ethnology. In some places, the custom has degenerated into a ceremonial, while in others the eating of this strange food still prevails as a kind of necessity to the lives of those who are addicted to it.

The Mexican devotees picked up a piece of clay in the temple of Tezcatlipoca and ate it with the greatest reverence, and also ate a piece of earth in swearing by the sun and earth. But the use of clay by the Mexicans was not merely a matter of ceremony, for the substance seems to have been an esculent in common use. Edible earth was sold openly in the markets of Mexico, and appears in the list of foods given by Gomara.

Cabeza de Vaca says that the Indians of Florida ate clay, and that the natives offered him many mesquite beans, which they ate mixed with earth. Venegas asserts that the Indians of California ate earth. The traditions of the Indians of San Juan Capistrano and vicinity show that they had fed upon a kind of clay, which they often used upon their heads by way of ornament. The Tatu Indians of California, according to Powers, mix red earth into their acorn bread to make the latter sweet and cause it to go further. Sir John Franklin relates that the banks of the Mackenzie River contain layers of a kind of unctuous mud, which the Tinneh Indians use as food during the seasons of famine, and even at other times chew as an amusement. It has a milky taste and the flavor is not disagreeable. The Apache and Navajo branches of the Athabascan family of North American Indians are not unacquainted with the use of clay as a comestible, although among the former it is now rarely used, and among the latter is employed only as a condiment to relieve the bitterness of the taste of the wild potato. In the same manner it is known to both the Zuni and the Tusayan.

In South America, likewise, the eating of clay prevails among the Indians on the banks of the Orinoco, throughout Brazil, and on the mountains of Bolivia and Peru.

In Western Africa, the negroes of Guinea have long been known to eat a yellowish earth called by them "caouac," and the flavor and taste of which is very agreeable to them and said to cause them no inconvenience. Some addict themselves so excessively to the use of it that it becomes to them a real necessity, and no punishment is sufficient to restrain them from the practice of consuming it.

When the Guinea negroes were in former times carried as slaves to the West India islands, they were observed to continue the custom of eating clay. But the "caouac" of the American islands, or the substance which the poor negroes attempted to substitute in their new homes for the African earth, was found to injure the health of the slaves who ate it, and so the practice was long ago forbidden and has possibly now died out in the West India colonies. In Martinique, a species of red earth or yellowish tufa was formerly secretly sold in the markets, but the use of it has probably ceased in the French colonies also.

In Eastern Asia a similar practice prevails in various places. In the island of Java, between Sourabaya and Samarang, Labillardiere saw small square reddish cakes of earth sold in the villages for the purpose of being eaten. These were found by Ehrenberg to consist for the most part of the remains of microscopic animals and plants which had lived and been deposited in fresh water. Some of the Japanese, too, are addicted to the practice of eating earth. Dr. Love, some time ago, published an analysis of a clay which is eaten to a considerable extent by the Ainos; it occurs in a bed several feet thick in the valley of Tsietonai (eat-earth valley) on the north coast of Yesso. It is light gray in color and of fine structure. The people mix with the clay fragments of the leaf of some plant for the aromatic principle it contains. They eat the earth because they think it contains some beneficial substance, not because it is a necessity with them. They have meat and abundance of vegetable food. The clay is eaten in the form of a soup. Several pounds are boiled with lily roots in a small quantity of water, and afterward strained. The Ainos pronounce the soup very palatable.

In Runjut Valley, in the Sikkim Himalayas, a red clay occurs, which the natives chew, especially as a cure for the goitre.

In Smyth's Aborigines of Victoria, it is stated that a kind of earth, pounded and mixed with the root of the "mene" (a species of Hæmadorum), is eaten by the natives of West Australia.

In Northern Europe, especially in the remote northern parts of Sweden, a kind of earth known by the name of "bread meal" is yearly consumed by hundreds of cart loads, it is said. A similar earth is commonly mixed with bread in Finland. In both these cases, the earth employed consists for the most part of the empty shells of minute infusoria in which there cannot exist any ordinary nourishment.

Some of the Siberian tribes when they travel carry a small bag of their native earth, the taste of which they suppose will preserve them from all the evils of a foreign sky. We are told that the Tunguses of Siberia eat a clay called "rock marrow," which they use mixed with marrow. Near the Ural Mountains, powdered gypsum, commonly called "rock meal," is sometimes mixed with bread. The Jukabiri of Northeastern Siberia have an earth of a sweetish and rather astringent taste, to which they ascribe a variety of sanatory properties when eaten.

In North Germany, on various occasions where famine or necessity has urged it (as in long protracted sieges of fortified places) a substance called "mountain meal," similar to that used in Sweden and Finland, has been employed as a means of staying hunger.

According to Pliny, the Romans had a dish called "alica" or "frumenta," made of the grain zea mixed with chalk from the hills of Puleoli, near Naples.

According to the myths of the Cingalese, their Brahmins once fed upon earth for the space of 60,000 years.

Chemical Powers of Minute Sea Creatures.

All known chemical substances are present in solution in sea water. In spite of the precision and delicacy of their analyses, chemists can never determine absolutely the exact proportions in which these elements are present; they can merely indicate their presence as "traces," especially in the case of the very rare elementary substances. Except for the chlorates and sulphates, which are easily obtained by evaporation, spectrum analysis alone shows us the existence of these elements in sea water.

It has been shown that the sheets of copper on ships often become covered with a layer of silver from the water of the sea, deposited there by electro-chemical action; and nevertheless all our minutest methods of analysis have not yet been able to detect this metal in the waters of the ocean. Iodine, found in such abundance in the ashes of marine plants, reveals itself to analysis only in traces. These organisms, then, must have the power to extract and concentrate it from the mass of water in which it exists in such dilute form. Many chemical elements exist in the water in very minute quantities; that at the bottom of the sea, for example, contains carbonate of lime only in the proportion of one to ten thousand. This does not prevent plants and living organisms, such as the Foraminifera, the corals, echinoderms, mollusks, etc., from finding in this small proportion what is necessary to their constitution and to their existence. At the death of these organisms, the mineral matter accumulates and ends by forming great rocky masses. In all parts of the ocean there live, multiply and die myriads of calcareous organisms that fall continually in showers to the bed of the sea. The calcareous rocks, that on the earth attain often great thickness and cover thousands of square miles, have this origin.

Of all the deposits that form in the depths of the ocean, the most singular and the most curious are the irregular nodules varying from the size of a small pea to that of an orange, and composed of hydrated oxides of manganese and iron. They contain 25 per cent of binoxide of manganese, 15 of peroxide of iron, 30 of water, besides divers silicates, and 30 per cent of various substances, among which careful analysis has shown the existence of thallium, molybdenum, tellurium, vanadium, nickel, lithium, cobalt, barium, strontium, tin, copper and lead. The origin of these associations of diverse and rare substances has not yet found any plausible explanation. How have such minute quantities of manganese as those that have been shown in the composition of rocks, and that do not exceed the twentieth part of those of iron, come to form concretions in which this substance predominates? The soundings made by Murray and Buchanan on the west coast of Scotland have shown that these nodules are found especially in the marine slimes where pyrite and other compounds of iron exist. These slimes accumulate slowly after having passed through the bodies of worms or other organisms an infinity of times. At each passage a little manganese and iron is added, and in the course of ages these oxides, becoming more and more concentrated, form these bizarre and remarkable nodules.

The eminent German botanist Cohn has shown that the agents really effective in freeing the carbonic acid that keeps in solution the mineral matter are minute plants, around which are deposited those substances that the water, deprived of carbonic acid, can no longer dissolve. Wethered has proved that the limestone of various epochs is composed in great part of organisms consisting of twisted tubes, simple or branched, which have been given the names of girvanella, micheldeania, etc.; these organisms are plants secreting calcareous matter in their cellules; they thus form at their death calcareous agglomerations that make up rocks. But while certain plants participate by their constant action in the formation of these rocks, others, on the contrary, have a diametrically opposed action. They dissolve and destroy the calcareous elements. By his researches, Duncan showed to scientists this curious fact, that fossil corals are often found perforated by minute tubes. He concluded from this that they had vegetable parasites. All the observations made during recent years on the deposits that cover the bottom of the ocean lead to this conclusion: Wherever substances are found in solution in sea water, they can be extracted thence only by the wonderful action of living organisms.

What Shall We Eat?

W. O. Atwater, Ph.D., professor of chemistry in Wesleyan University, in a pamphlet issued under the auspices of the United States Department of Agriculture, says:

"A quart of milk, three-quarters of a pound of moderately fat beef, sirloin steak, for instance, and five ounces of wheat flour, all contain about the same amount of nutritive material; but we pay different prices for them and they have different values for nutriment. The milk comes nearest to being a perfect food. It contains all of the different kinds of nutritive materials that the body needs. Bread made from the wheat flour will support life. It contains all of the necessary ingredients for nourishment, but not in the proportions best adapted for ordinary use. A man might live on beef alone, but it would be a very one-sided and imperfect diet. But meat and bread together make the essentials of a healthful diet. Such are the facts of experience. The advancing science of later years explains them. This explanation takes into account, not simply quantities of meat and bread and milk and other materials which we eat, but also the nutritive ingredients or 'nutrients' which they contain."

The chief uses of food are two: To form the material of the body and repair its wastes; to yield heat to keep the body warm and to provide muscular and other power for the work it has to do. Dr. Atwater has prepared two tables showing, first, the composition of food materials, the most important of which are the nutritive ingredients and their fuel value; second, the pecuniary economy of food, in which the amount of nutrients is stated in pounds. In the first table we find that butter has the greatest fuel value, fat pork coming second, and the balance of the foods mentioned being valued as fuel in the following order: Cheese, oatmeal, sugar, rice, beans, cornmeal, wheat flour, wheat bread, leg of mutton and beef sirloin, round of beef, mackerel, salmon. Codfish, oysters, cow's milk, and potatoes stand very low as fuel foods.

From the second table we learn that the greatest nutritive value in any kind of food of a specified value (Dr. Atwater takes 25 cents' worth of every kind of food considered) is found in cornmeal. In 10 pounds of cornmeal there are a trifle more than 8 pounds of actual nutriment. In 8¼ pounds of wheat flour there are over 6¾ pounds of nutriment; in 5 pounds of white sugar there are 4⅞ pounds of nutriment; in 5 pounds of beans there are 4 pounds of nutriment; in 20 pounds of potatoes there are 3¾ pounds of nutriment; in 25 cents' worth of fat salt pork there are 3½ pounds of nutriment; in the same value of wheat bread there are 2¼ pounds; in the neck of beef, 1¾ pounds; in skim milk cheese, 1¾ pounds; in whole milk cheese, a trifle more than 1½ pounds; in butter, 1½ pounds; and in smoked ham and leg of mutton about the same; in milk, a trifle over 1 pound; in mackerel, about 1 pound; in round of beef, ¾ of a pound; in salt codfish and beef sirloin, about ½ a pound; in eggs at 25 cents a dozen, about 7 ounces; in fresh codfish, about 6 ounces; and in oysters at 35 cents a quart, about 3 ounces.—Troy Press.

Man's Debt to Spiders.

It cannot be reasonably doubted that one of the most interesting features connected with the natural history of spiders is their habit of gaining a livelihood by spreading nets for the capture of prey. It may be that the large share of the attention of naturalists that this habit has attracted is to be attributed to the fact that it appears to be confined in the animal world to spiders and men. This circumstance is of itself sufficiently remarkable to call for special comment; but its interest is not a little enhanced by the reflection that since spiders made their appearance in the history of animal life vast ages before man came upon the scene, none of us can justly claim that any member of our own kind was the first in the field in the invention of the art of netting. Possibly, indeed, the oft-repeated and unavoidable observation of the efficacy of a spider's web for the purpose of catching otherwise unobtainable prey may have roused in the brain of some intelligent hunter among our ancestors the idea of the practical utility of a similar instrument for the capture of fish or other eatable forms of life. But if this be so, civilized man has long forgotten the debt of gratitude he owes to spiders. For, to the average individual among us, a spider is a thing to be looked upon and spoken of with fear and dislike amounting to loathing, and to be ruthlessly destroyed when a safe chance of destruction is afforded. R. I. POCOCK