Since that epoch, phonograms have succeeded one another, and we can no longer count the speaking letters exchanged between the old and new world.

The improved phonograph has now become a practical instrument of daily utility. It daily serves as a stenograph to which is dictated the answers to letters received, and which the apparatus reports at leisure to an employe whose duty consists in transcribing what he hears, and whose entire science is limited to writing properly, under phonographic dictation, and either with a pen or typewriter. The phonogram may even replace printing office manuscript, and dictate the copy directly to the compositor—an application that has already been made of it in America and England.

Of the other applications pointed out by Col. Gouraud in a note that the Academy has done the honor of an insertion *in extenso*, we shall enumerate the following few:

Postal transmission of phonographic messages in phonograms.

Preliminary registration of the speeches of statesmen, lawyers, preachers, etc.

Repetition of solos by actors and singers, with a view to correcting articulation and pronunciation.

Preservation and indefinite repetition of the voices of celebrated men, of the farewells of the dying, of the words of a beloved relative, etc.

One of the most curious experiments that the new Edison phonograph, combined with the motograph and carbon transmitter, has permitted of carrying out is telephonography, that is to say, the transmission to a distance and the phonographic inscription of a phonogram.

The programme of the phonographic session that followed the communications of Messrs. Janssen and Gouraud merits special mention. It was as follows:

Speech of Mr. Janssen and of Mr. Berger, addressed to Mr. Edison. Messages from the correspondents of some French journals at London addressed to their editors. A few words in the following languages: French, English, Spanish, Italian, Dutch, Greek, Latin, Syriac, Turkish, Hebrew, Arabic.

Music.—La Marseillaise played by the military band of the Queen's Guards, Hail Columbia played by the same band. Marche du Regiment, a cornet and piano duo, the music by Gounod. Duo of cornets-a-piston. Gounod's Ave Maria, sung, and accompanied by himself.

The session terminated with felicitations sent phonographically by the Academy to the fortunate inventor, and with the desire to see him soon at Paris on the occasion of the Universal Exposition.—*La Nature.*

NEW ELECTRIC LAUNCH.

THE electric launch Malden, designed and moulded by Mr. W. Sargeant, of Strand-on-the-Green, Chiswick, W., was, during the past summer, an object of interest on the river Thames, especially during the Henley and Maidenhead regattas. This carvel-built craft shown in the illustration is 30 ft. 6 in. long, 4 ft. 10 in. beam, with a draught of 2 ft. 4 in. aft and 22 in. mean. The electrical energy is stored in 48 accumulators, contained in ebonite boxes, which are placed in lead-lined trays under the seats. The midship sections of the vessel being perfectly flat, in the event of the craft taking the ground, the acid contained in the cells is not likely to slop over. Twenty-four of these cells are arranged on each side of the boat, and with one charge contain electrical energy sufficient to propel the launch for ten hours, at about ten miles per hour. The motor is a 6 in. Immisch, rotating at about 550 revolutions per minute, and calculated to give about 2¾ brake horse power.

In the counter of the launch is placed a resistance frame, and over that, upon the deck, are fixed two switches, one for starting the motor, and the other for reversing, both being under the control of the man steering. The ammeter and voltmeter are also in his view.

The motor is fixed under the floor aft, and is connected with the accumulators, which are worked in parallel. In place of the objectionable whistle of the steam launches a large and melodious ship's bell (Jensen's patent), which is in every way efficient, is placed on the fore deck as shown in illustration, and sounded electrically by the steersman, the current being supplied direct from the accumulators. All lights—port, starboard, and head lights—are incandescent lamps, all supplied from the accumulators.

All the accumulators being placed under the seats, a clear space is left from stem to stern, which will accommodate twelve comfortably. In fact, the interior of the Malden, fitted as she is with well-stuffed cushions and a good awning, becomes one continuous and agreeable lounge. The seats are removable, so that the accumulators may be easily examined if necessary at the time of charging, which is proposed to be accomplished during the night. The charging can be done ata reasonable cost from charging stations, which are now being constructed and placed up the Thames by Messrs. Immisch & Co. The first of these stations was designed by Mr. Sargeant, and in all appearance resembles one of the large house boats common on the Thames. It consists of a river barge 70 ft. long by 14 ft. beam, on the floor of which, upon a suitable foundation, is placed a semi-portable compound steam engine of 25 horse power nominal

Countershafting placed in the fore part of the barge is driven direct from the flywheel, which runs at 120 revolutions per minute. This countershafting drives the dynamos which, through insulated copper heads, supply the current to the accumulators in the launches moored alongside the station. The engine is covered with a large lantern in the roof, which can be quickly removed if at anytime it is necessary to take the engine out.

Electrical power for river launches is now an established fact on the Thames, and will probably be much improved during this year. Messrs. Sargeant & Co. are constructing three very elegant electric launches, one of which is expected to be the fastest ever produced, which will contain accumulators provided by the Electrical Power Storage Co. The motor is specially designed for water propulsion, and will be fitted with Sargeant's patent motor shaft and thrust block combined, which is self-lubricating and reduces friction to a minimum.

One launch can be seen in the course of construction at the Kew Bridge charging station, near Kew Bridge. The next charging station above Kew Bridge is situated opposite the water works at Hampton, and is the floating one before mentioned. And it is also proposed by this firm to construct a station above Richmond Bridge. There will be no difficulty in obtaining sufficient energy at any one of these stations for a run of 50 or 60 miles, according to the capacity of the accumulators contained.

The annexed illustration is executed from a photograph of the Malden in Bray Lock on her journey from Cookham to Kew Bridge, which was accomplished with one charge of electrical power.—*English Mechanic.*

GASTON PLANTE.

IN current electrical literature one of the most familiar names is that of Gaston Plante, who died sud-

GASTON PLANTE.

denly at Paris on May 24. No article on the storage battery is complete without a statement to the effect that the principal work of Plante's life was his investigation into the voltmeter, the practical result of which was the invention of the storage cell with lead plates. Plante experimented upon all conceivable metals and combinations of metals to be used for electrodes in voltmeters, and the result of his numerous tests was to show that lead is, all things considered, the best active material from a practical point of view, though the amount of energy which he found possible to store per unit of weight was greater in the case of some other metals. Plante was born in 1834 at Orthez. His scientific studies were pursued at the Conservatoire des Arts et Metiers, in Paris. He took a position as a laboratory assistant, and soon began an investigation into the nature of electro-polarization, which led to the discovery of the accumulator

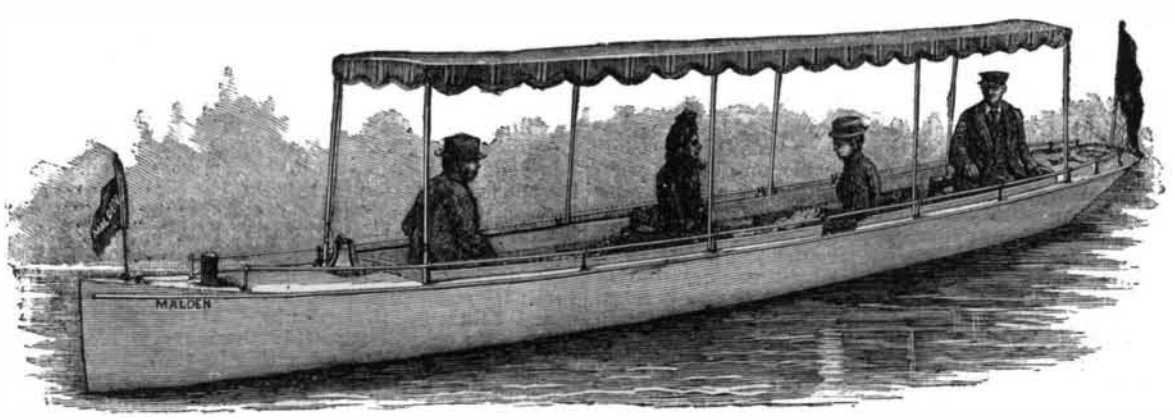
The immediate cause which prompted him to undertake his first long series of investigations was not the desire to find a storage battery, because in those days the application of dynamos to electric lighting was still unknown; it was the desire to study the effects of electric discharges of great quantity, which were not attainable with frictional machines and Leyden jars. The discovery of the lead accumulator was, so to speak, a by-product of his investigation.

Plante continued for many years to add to the number of cells in his possession; he studied their progressive formation with keen interest, and as he had to rely chiefly upon the Bunsen battery for his charging current, the process was both tedious and costly. Many of his experiments on the discharge were of the most brilliant and even daring character. His eyesight almost failed him for a considerable time before his death, and the cause was ascribed to too close application to experimental work. He was by no means blind to the possibilities of the practical application of the lead battery, and among other suggestions for its use he referred at an early date to the electric light, although in an era before Swan and Edison were known, and when the dynamo was scarcely as yet a commercial machine. He was unable to foresee the full importance of the suggestion.

He also invented what he called the "machine rheostatique," being essentially a commutator which, on being turned by a crank, rapidly changed the grouping of the secondary cells from parallel to series. Of late years Plante devoted himself almost exclusively to the reproduction of meteorological phenomena in the laboratory by electrical effects, and he has succeeded in thus imitating hail, globular lightning, etc. His latest publication was a small book on this subject, printed a little over a year ago, and he has also contributed to the exhibition at Paris some very interesting apparatus and specimens in connection with this work.

In 1881 M. Plante received the Diplome d'Honneur at the Paris exhibition, and he was also made a Chevalier of the Legion d'Honneur. A little later the Academie des Sciences conferred upon him the "Prix Lucaze," and he also received the Medaille d'Ampere from the Societe de Encouragement pour l'Industrie Nationale.

The honors which were showered upon M. Plante during the latter portion of his career did not induce him in any way to modify the quiet and retired life which he had led for so many years. Nearly his whole time was passed in his laboratory in the Rue des Tournelles, where, however, a kindly welcome was assured to every visitor, more especially to such as happened to take an interest in the pursuits in which his attention was absorbed.—*Western Electrician.*



NEW ELECTRIC LAUNCH.

WILLIAM TEMPEL.*

G. V. SCHIAPARELLI.

WILLIAM ERNEST TEMPEL, astronomer at the observatory of Arcetri, died on March 16, after a long and painful illness.

His life was a notable example of a strong calling drawing man with overwhelming force to a fixed object, and surpassing the greatest obstacles.

Born of a poor family, Dec. 4, 1821, at Nieder-Cunersdorf, in upper Lusatia, he early learned the art of lithography, which he followed at first in many cities of Germany, and attained in it great ability, united with delicate artistic feeling.

Endowed by nature with an imaginative and restless temperament, after a time he left his fatherland to seek his fortune in foreign countries. He lived three years in Denmark, then came to Italy; and in 1859 we find him living in Venice. At this time began his interest in astronomical matters. He purchased with his savings a telescope from Steinheil, not a very large one, to be sure, but very good, and he was soon recompensed by his first discovery, the comet of 1859. In the same year he began to make a map of the well known group of the Pleiades, in which in a short time were included six large stars and many hundreds of smaller ones.

How many telescopes since Galileo had been turned to that part of the heavens! Yet, aided by the excellence of his instrument and by uncommonly keen vision, Tempel there found that which in 250 years, with telescopes of every size, none had been able to see. He discovered the famous nebula of the Pleiades, whose existence is even now doubtful to many, and he was harshly disputed by those who in astronomy—as is often the case in other departments of knowledge—claim to be the highest critics.

Lately, however, celestial photography has come to confirm the observations of Tempel, and not only removes every doubt of the existence of that nebula, but shows that what Tempel saw is the brightest and thickest part of a nebulous mass extremely complicated and extensive, which extends through nearly all the space occupied by the group of the Pleiades and forms one mass with it. He thus showed in a convincing way the close connection existing between the nebulæ and the stars, and utterly destroyed the belief, still held by Humboldt in his Cosmos, that the nebulæ are collections of stars of a high order, in extent and formation like the milky way, and situated at a much greater distance than ordinary stars.

In 1860 Tempel went to live in Marseilles, and in 1861 served awhile as assistant in the observatory there under the direction of Benjamin Valz. In that position he remained only six months. Loving above everything his own independence, he continued to follow his profession as engraver in that city until 1870, alternating these labors with astronomical investigations. In Marseilles he discovered six small planets, Angelina (64), Maximiliana (65), Galatea (74), Eurynome (79), first discovered a little before by Watson in America, Terpsichore (81) and Clotho (97); at that time those discoveries had greater fame and greater importance than would be given to them at present. It was then indeed reasonably supposed that the number of the smaller planets between Mars and Jupiter was limited; this does not seem likely to the present astronomers, already embarrassed by the mighty army of "*atomi planetarii*," now increased to about 300, and of which no one can see an end. Most important to astronomy were, and always will be, his discoveries of comets, in which he was especially assisted by a very keen eye, the perfect climate of the Provence, and the Steinheil telescope of excellent clearness. These are the comets discovered by Tempel in Marseilles: 1860 IV, 1862 I, 1863 IV, 1864 II, 1866 I, 1867 I (with Stephan), 1867 II, 1869 II, 1869 III, and 1870 II (with Winnecke); these gained for Tempel several prizes from the Imperial Academy of Vienna.

Of these the most important, from the result to which it led, was 1866 I; which, rather than a comet, should be called a remnant or the ruins of a comet. In the course of the destruction of that body came the thick swarm of bright meteors of November, which at

* From *La Nazione* (Italian), April 5, 1889. Translated for the *Sidereal Messenger* by F. W. Fiske, of St. Paul.