

Correspondence.

The *Thylacinus cynocephalus*.

To the Editor of the SCIENTIFIC AMERICAN:

I notice two letters in your last issue relating to the *Thylacinus cynocephalus* and the three specimens of the animals on exhibition at Washington. The trouble is caused by the inadvertent omission of the words "adult male" in the copy sent you of the original MS. The specimens at Washington, female and two young, are well known. J. CARTER BEARD.
Brooklyn, N. Y., November 4, 1904.

Remarkable Clock with Automata.

From the "Lexikon der Uhrmacherskunst" we take the following description of a curious clock of recent date:

The clock was made by one Christian Martin, who lived in the Black Forest, Germany, and is contained in a cabinet 3.02 meters wide, 2.72 meters high, and 0.55 meter thick.

The face, or front of this clock, is divided vertically into seven sections, and each of these into five smaller sections or frames, displaying in all thirty-five frames, in each of which there is some movable thing.

Upon this multiple face one may read the seconds, the minutes, the hours, the days, the weeks, the months, the four seasons, and the common and leap years. Harmonious music accompanies the movement of each object. Situated in the center of the front is the time-dial or clock-face proper. An angel at the bottom of the central section tells off the minutes on a gong. In the central frame of the third section are two figures of which one strikes the quarters, while the other, with the finger of her right hand, points to the quarter just struck, providing in this way a visible as well as an audible signal. The lowest frame of the same section displays successively the figures of an infant, a youth, a full-grown man, and a person of ripe old age, corresponding with the quarter struck, intending thus to exemplify the four ages, instead of the time-honored seven ages of man's life.

Death, in the third frame of the fifth section, sounds the full hour. As soon as the hour is struck, the twelve apostles appear in an oval frame just above the clock-face, one after the other, each saluting Christ, who is placed in the frame directly above them, and receiving a blessing from Him. After playing their part they withdraw from view, and a cherub guards the doorway.

The day of the month is shown on the dial in the second space of the third section. The maker computed the leap-years up to the year 99,999. The days of the week are marked by mythological figures which appear in the top frame of the third section. The twelve signs of the zodiac, corresponding to the twelve months of the year, are also shown in the topmost frame of the fifth section.

The Moon displays her various phases in the circular frame just below the time-dial. Beginning with 10 P. M., a trumpeter industriously announces the hours upon his trumpet till 4 A. M., when he is relieved from duty by a cock that stands perched upon a pedestal in the next frame. With the dawn the cock, true to its nature, flaps its wings and crows. Across the front in the fourth frame of section six we see a soldier, who heralds each new year with an air played upon his bugle. In section one of the bottom frame we see an old bell-ringer, whose duty it is to sound the hours of 6 A. M., 12 M., and 6 P. M., the hours of prayer. An old beggar in the frame next on the right reminds us of our *devoirs* by kneeling, and with folded hands supplicating the Deity. At the last stroke of the bell he rises, and the scene of action is transferred across the board to an organ grinder, who grinds away, accompanied by a clown and bell in the adjacent frame. The uppermost frames in sections 1, 2, 6 and 7 show the fourteen scenes in the Passion, while the second frames of sections 1 and 7 show the seven days of the creation.

The Current Supplement.

The English correspondent of the SCIENTIFIC AMERICAN opens the current SUPPLEMENT, No. 1507, with a very thorough and finely illustrated description of a universal 300-ton testing machine. J. C. Barclay describes some modern high-speed printing telegraph systems. Mr. L. Ramakers presents a very full description of the Siemens-Halske printing telegraph. His text is excellently illustrated by some handsome photographs and line drawings. Dr. Caird recently read before the Royal Philosophical Society of Glasgow a paper on the developments in means of communication by sea during the nineteenth century. The paper is published in the current SUPPLEMENT. The St. Louis correspondent of the SCIENTIFIC AMERICAN writes instructively on Germany at the Fair, his article being accompanied by some photographs especially taken for us. "Utility of Automobiles for Military Operations" is the title of an article which gives much valuable information on a subject of considerable in-

terest at the present time. Capt. William W. Harts contributes a well-illustrated article on the debris-restraining barriers of the Yuba River.

Electrical Notes.

The emanation produced by radium has been frequently investigated, so that many of its properties are known; the question as to whether the particles constituting this emanation are charged or not, seems, however, not to be definitely solved, though a solution of the same would be necessary for obtaining an adequate idea of the decomposition of radium atoms. In an article published in the *Physikalische Zeitschrift*, Mr. J. A. McClelland examines as accurately as possible whether the emanation bears an electric charge, as would seem to be the case according to Rutherford's work. It is definitely shown that such is not the case, this being of the greatest bearing on radium theories. As radium atoms are sure to give off positively-charged particles (being the alpha-rays) the emanation particles cannot possibly be the remainder of the atoms left by one or several alpha-rays, as in that case the emanation should be negatively charged. The atoms therefore must have given off a negative charge of the same magnitude, either by an emission of negative particles or in any other way.

The favorable experience gained in connection with the use of storage batteries in telegraphic service induced the German Telegraph Department very soon to utilize the advantages of accumulator operation also in connection with telephone service, when no appreciable difficulty was encountered in telephone exchanges. As regards, however, the use of accumulators as microphone current sources in subscribers' stations, special experiments proved necessary, accumulators being discharged there rather slowly, with small currents and at great intervals, so as to give rise to self-discharges and sulphating of the plates. In the *Elektrotechnische Zeitschrift*, Mr. L. Brückmann records some preliminary experiments made by imitating the conditions of service in a much-used subscribers' station. As no drawbacks were met with at first, these experiments were extended in January, 1895, to the practical service, thirty-six subscribers' stations being fitted with storage batteries of the Böse system. The following conclusions may be drawn from the behavior so far shown by these storage batteries: Though the working of the accumulators as far as their resistance against shocks, oxidation of the terminals, etc., was concerned, had proved rather satisfactory, the condition of the plates was found to be frequently worse than the electric behavior would have warranted. There is a risk of sulphated cells being taken in operation again, such accumulators being subject to complete destruction. Apart from this, however, the charging of microphone accumulators requires much more time and work than that of accumulator cells in normal operation, every cell having to be treated separately. Moreover, different conditions would obtain for different types of cells, so that different kinds of accumulators cannot be connected in a common charging circuit (in series). On the other hand, the initial advantages of accumulator operation for telephone service have lost much of their importance because of the introduction of improved microphones. No further extension of storage battery operation was therefore made by the Telegraph Department.

In a note recently communicated to the French Academy of Sciences, Mr. A. B. Chauveau records an interesting observation on electric dispersion made by himself during the thunderstorm of August 4, and which goes to confirm a result enunciated by the experimenter in a previous memoir on the thunderstorm of July 24. After a very hot and beautiful day, during which the heavens had been very clear, without any other indication of a forthcoming thunderstorm than the appearance close to the sun of some clouds toward 6 o'clock, the thunderstorm, which was not anticipated up to 6 h. 30 m., was seen clearly in the west toward 6 h. 45 m., and moving with an extraordinary rapidity, arrived at the Eiffel Tower five to six minutes afterward, with a waterspout and whirlwind. The darkness that arose suddenly did not allow of any measurements being made, but the author noted at some minutes' interval on one side an extremely rapid dispersion of positive electricity, and on the other a negative dispersion, which was about normal and rather small as compared with the former. The positive dispersion was such that the leaves of the electrometer approached one another visibly, as under the influence of a flame or a strongly radioactive substance, so that the author would have supposed a leakage in the instrument, if the negative dispersion tested immediately afterward had not shown its ordinary behavior. In the course of the afternoon, in fact, without any interruption from 2 h. 30 m. to 6 h. 30 m., dispersion measurements were made, which did not present any anomaly in fair weather, the negative dispersion remaining constantly more rapid than the positive. The mutual ratio of the two

dispersions would even show a decided increase, passing from 3.3 (at 3 h.) to 4.9 (at 5 h. 30 m.). The thunderstorm inverted abruptly this ratio in a doubtless much stronger proportion. Taking into account the violent rain during the two observations of July 24 and August 4, the most likely hypothesis for explaining these considerable negative charges carried along by the air would be to consider them as an analogous phenomenon to the well-known phenomenon observed in the neighborhood of waterfalls.

Engineering Notes.

The production of bituminous coal in the United States last year was 285,000,000 net tons, an increase over 1899, five years ago, of 94,000,000 tons, and an increase over 1893 of 155,000,000 tons, or much over 100 per cent.

The "Forward," the first of a series of scout warships to be built for the British navy, was successfully launched on October 27. The "Forward" is 384 feet long and 39 feet beam, and her engines will develop 16,500 horse-power, giving a speed of 25 knots, with a crew of 290. She is intended to search for a possible enemy, and convey quick information to a squadron.

June 23 was the hundredth anniversary of the birth of August Borsig, who may be called the Matthew Baldwin of Germany. Beginning as a carpenter, he as a man learned drawing and mechanics in a trade school; became foreman of a foundry; started one himself; developed it into a machine shop; turned out his first locomotive in 1841 and his five hundredth in 1854, and died a few months later.

A new coal wharf is being constructed between Marola and Cadimare, Italy, for the convenience of vessels discharging cargoes for the Italian navy, and for bunkering mer-of-war. Steamers will be able to lie alongside and discharge direct on to the trucks of the wharf, instead of as heretofore being obliged to lie off and discharge into lighters. This new wharf will, it is hoped, greatly expedite the clearance of British colliers, but it is to be regretted that the improvement will only affect vessels with cargoes for the Italian navy.

In the French motor car championship hill-climbing competition, which took place on the very long and severe ascent of the Ventoux mountain, several fresh records were made. The distance was 13½ miles, and in the class for heavy cars the time taken by the winner was 21 min. 12 sec., beating the record by 3 min. 38 sec. By the voiturette cars the time taken was 29 min. 59 sec., creating a fresh record of no less than 13 min. 36 sec. better than the previous record. The ascent is one of the stiffest in France, and the times show an extraordinary improvement on last year's meeting.

A new type of fuel has been devised by two gas engineers of Southend, England, the outcome of several years' patient investigation and experiments. The fuel is manufactured from what has hitherto been considered a waste product of chemical manufacture. This fuel is intended to supplant the asbestos or fire-clay balls which are at present utilized in gas-stove fires. It absorbs the blue Bunsen flame, which at present escapes, and converts it into heat. It also absorbs the carbonic oxide from the air, thereby considerably purifying the atmosphere, has no smell, burns brightly as a coal-fire, and, owing to the materials of which it is composed, is cheaper to produce than either fire-clay or asbestos balls, while the substance is also practically inexhaustible. The fuel also has the quality of retaining the heat for a considerable time, and, when ignited, gives three times as much heat as is possible with the asbestos or fire clay, with the same consumption of gas.

The highest tunnel in Europe is undoubtedly that of the new Jungfrau electric line which is to reach the summit of the mountain. According to recent reports the tunnel, which is now in construction, has passed the altitude of 3,000 meters (1.8 miles). As the road is entirely underground after reaching the altitude of 2,400 meters (1.04 miles) it may be safely affirmed to be the highest tunnel in Europe. The work, which commenced over ten years ago, is very slow. The second station, that of Rothstock, was opened to the public on the 2d of August, 1899, and the third, the Eigerwand station, not until the 1st of July, 1903. The next station, that of Mer de Glace, will not be opened before next summer, and perhaps only during 1906. The great length of time needed for the construction lies in the fact that the rock is especially hard and it is impossible to use quick-working drills. What is favorable is that there has been no water flow up to the present, as is the case in the Simplon tunnel. Until now the workmen have not suffered from the high altitude, but physicians fear that they may contract the mountain disease when they reach the higher points. It is estimated that it will be ten years before the road finally reaches the summit of the Jungfrau.

THE GERMAN NATIONAL PAVILION AT ST. LOUIS.

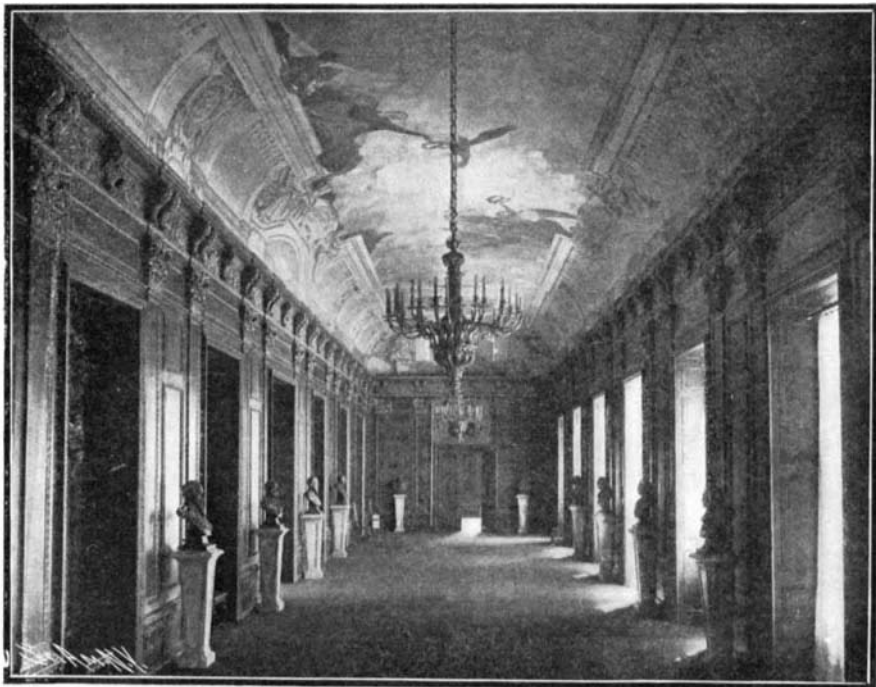
Among the forty or more nations which are participating in the Exposition at St. Louis, Germany was fortunate in securing the finest site that was reserved for any foreign exhibitor. The National Pavilion stands on a plateau to the east of the amphitheatre, which is crowned by Festival Hall and the Colonnade of States. It overlooks the Cascades and Cascade garden to the west; to the south of it stretches the long façade of that beautiful structure, the Mines and Metallurgy Building; and with the dark green of the woodland as a background, its fine proportions are shown up with a distinction and emphasis that must be very gratifying to the sons of Germany. It was a happy idea of Emperor William, under whose oversight the plans were prepared, to



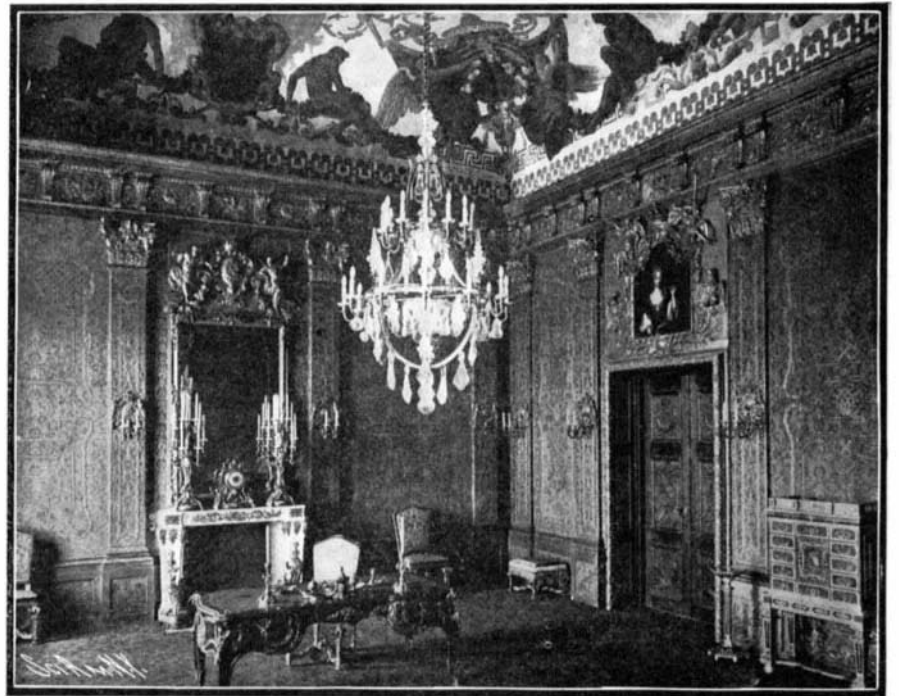
Reproduction of the Central Portion of the Palace of Charlottenburg.

a classic pediment. The drum of the dome is pierced by eight lofty windows, and it is marked by a Corinthian colonnade, the columns of which are slightly taller than those of the stories beneath. The curve of the dome is broken and relieved by circular windows, while its summit is crowned by a lofty lantern, surmounted by an heroic figure, whose gilded form may be seen flashing in the sunlight from any portion of the Fair grounds. Surrounding the pavilion are gardens that are accurate reproductions of those around the original castle.

Much of the interior of the pavilion is a faithful reproduction of the Charlottenburg interior. Perhaps the most imposing room of all is the spacious oak gallery, the doors and wainscoting of which are an exact reproduction of the original, as

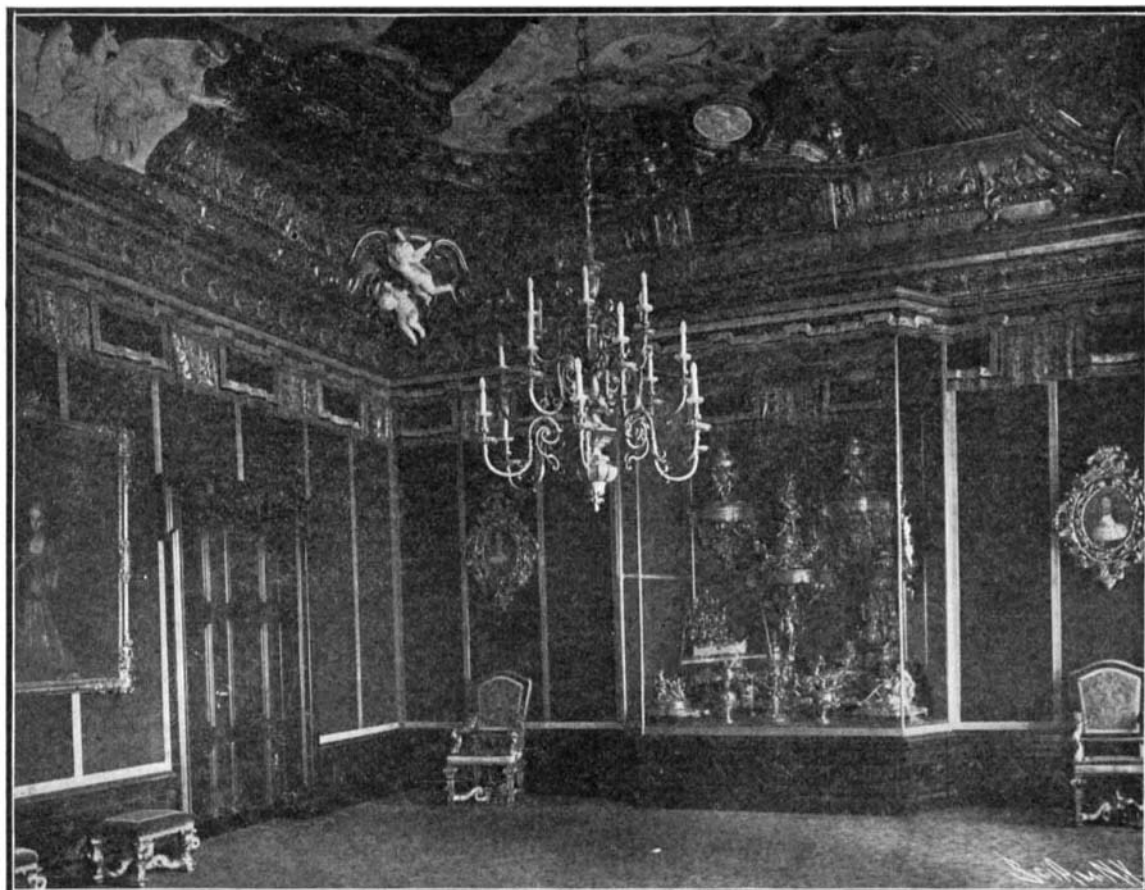


The Oak Gallery, Containing the Busts of the Hohenzollern Family.



The Galloon Room, Containing Furniture Loaned from the Charlottenburg Palace.

make this pavilion a partial reproduction of a building which is as conspicuous in German history as the building itself is prominent in the World's Fair grounds. The pavilion is copied with fidelity from the central portion of the famous castle at Charlottenburg near Berlin. The castle itself was built near the end of the seventeenth century by Frederick I., the first King of Prussia. It was designed by Andreas Schleuter, the great German architect of that period. It is at once apparent from the photograph herewith reproduced, that the architecture of the Charlottenburg castle is imposing. The main façade is in three stories. In the center above the main entrance, towering over 150 feet skyward, is a lofty dome. The façade of the first floor is in rustic stone; the second and third floors are enriched with twelve Corinthian columns. In the center, beneath the shadow of the great dome, is a projecting bay crowned with



The Brandenburg Room, Showing in Case the Gold and Silver Wedding Presents of the German Emperor.

is the richly-decorated ceiling. Down each side and at each end of the room are busts of the Hohenzollern family, and on the walls is a portrait of Queen Charlotte, after whom the palace was named. Another handsome room herewith illustrated is the Brandenburg room, which contains the actual palace furniture, brought over from the room of the same name in the German palace. Imperial portraits adorn the walls, and at one end is a large glass case containing the silver and gold wedding presents of the German Emperor. Another display of the royal furniture is made in the Galloon room, over the entrance door of which is a portrait of Queen Christine, the mother of Frederick the Great. In the same building are the offices devoted to the various chiefs of the German Commission. Last and by no means least among the notable features of this structure is the peal of bells in the tower belfry, which is rung at stated