Correspondence.

The Trap-Door Spider.

To the Editor of the SCIENTIFIC AMERICAN:

In your issue of the 30th July, is an article by C. E. Hutchinson, on "A Trap-Door Spider," placing its habitat in California. It has always seemed strange to me that this spider is assigned to the Pacific Coast when I know that it is found in numbers, at least in one place, on the Atlantic Coast.

Upon what used to be known as the Tidyman plantation (The Marsh), on Minim Creek, North Santee, South Carolina, when I was a boy, about the years 1850-1860, there were many of these trap-door spiders; and I must say that this is the only place where I have ever seen them. In front of the house there was an open grass-covered lawn of perhaps four or more acres, and many times I have amused myself hunting for the trap-doors of the spiders' tunnels. And I well recollect how interested I have been at the strength of the spiders in holding the doors shut as I attempted to open them. My recollection is that the spiders were stout, and possibly ¾-inch long; and that the tunnels were about ⅝ inch, or ¾ inch in diameter. Forty-four years have passed since I have been on the grounds, but the trap-door spiders were there at that time, and probably are there still.

This is why I have always been surprised to see this spider invariably written of as a native of California.

ARTHUR P. FORD.

Aiken, S. C., August 9, 1904.

Is Electricity as a Motive Power Unhealthful?

To the Editor of the SCIENTIFIC AMERICAN:

Anent the very pertinent question raised by Mr. Albert W. Dennis, in your issue of July 30, in an article entitled "Are Pressmen Affected by Electricity from the Belts?" the inference drawn from Mr. Dennis' observations and remarks would be that electricity as a motive power is unhealthful for the operatives, and others who, from choice or duty, remain near the belts or motors charged or driven with or by electricity.

As one of the pioneers in the electric field, I could not for a moment allow this impression to go abroad unchallenged.

It is clear that Mr. Dennis is a close observer, and has the welfare of his employes at heart. Both of these traits are in the highest degree commendable. It is also clear to any one at all familiar with the practical operation of electrically-driven plants, that one of three things must be the matter.

First. If the electricity carried by the belts escapes from the motor the insulation is defective, and needs immediate attention, to save waste of current and loss of power.

Second. If the current does not escape from the motor, but on the other hand it is frictional electricity with which the belts are charged, it is clear that the belts are slipping, with a resultant loss of travel and power, and they should be tightened until the vagrant current disappears. If it is not convenient to tighten the belts to a point where the generation of current ceases a pulley cover of rubber applied to the face of the pulleys would be advisable.

Third. If the motor is hot enough "so that the atmosphere always seems to be hot and surcharged so as to induce a sort of feverish feeling about the temples, etc.," as Mr. Dennis describes, it is clear that the motor is overloaded, as the resultant heat from a motor suited to its load should be nil. After remedying the electrical discharges, and other troubles as above outlined, Mr. Dennis will probably find that it is lack of ventilation and not electrical troubles his people have been suffering from. The homeopathic doses of magnetism or electricity one would be able to receive in a few minutes' stay in a press-room as described, would be too infinitesimal to be appreciable and certainly not so liable to cause nausea as a combination of hot air, printers' ink, and machine oil in a poorly-ventilated room.

That the magnetic influence of motors operated in close proximity to the human body from day to day for long periods under proper conditions is of great benefit to the person so brought within its influence, is the firm belief of the writer, and he has yet to see, in nearly twenty years' experience and observation in the various fields of electrical work, a single instance where it was not beneficial. When Leo Daft, Thomas Edison, Vanderpole, and F. J. Sprague began the crusade (along different lines but all leading to the same end) which led up to the abandonment of the hay motor (mules and horses), in favor of electric traction, and incidentally the adoption of the electric motor for all kinds of motive power, there was no other school than experiment and observation in which to learn the mysteries of the subtle fluid, consequently many of us were graduated from it.

The writer well remembers the many cats killed by the electric cars on the first roads equipped, while taking their evening electrical bath by rolling along between the rails of the road bed.

Pussy, like man, has grown wise to the fact that the cars sometimes kill, and while she may yet be seen in the early evening disporting herself near the rails it is rare indeed nowadays to find one which has been killed by the cars on the older roads. The writer having been a horse-car man previous to the advent of electric traction, was quick to note the antics of the cats, and was led to investigate the influence of electric traction on man. After transforming several horse-car lines to electric lines, and converting the drivers into motormen, it was noted that invariably the health of the men began to improve and they began to take on flesh. As they were running over the same route as formerly, and were exposed to the same weather conditions (the vestibule not having been invented), there was no way to account for improved health, snap, and vigor, except as the result of the imperceptible magnetism of the motors, or the proximity of heavy electric currents.

While the writer was superintendent of the San Antonio (Tex.) Street Railway in the early nineties he called the attention of Dr. F. M. Hicks, the company's surgeon (and one of the most noted practitioners of Texas to-day), to his observations as above. Shortly afterward Dr. Hicks requested me to take on two consumptive citizens from Illinois as motormen. They were accordingly installed, and in a few months were both apparently restored to robust health. It is true that San Antonio is a healthy resort for this type of disease, and if there was no sequel to my story it would lose its point. Now for the sequel! After about two years' service one of these left the employ of the electric railway and retired to a farm on the outskirts of the city; within a year his disease returned and he died. The other continued in the service for several years, and when the writer saw him last, he seemed still to be in the same robust health; he informed me, however, that he quit the road for about six months, at one time, and returning ill health warned him to again go back to the service, which he did and is now at work in Houston. Another horse-car conductor in a poor state of health was changed to the electric cars and after running for two years his highly nervous, emaciated form had rounded out to magnificent proportions at the time he left the service to embark in the cattle and horse business. In less than two years after abandoning the motor cars he died from nervous debility and exhaustion. An engineer from Indianapolis, Indiana, who came south for his health, was recommended by the writer and put in charge of the press-room plant of the Daily Express operated by electric motors. The Daily Express building is a magnificent example of the modern publishing house, and its press-rooms as well as all other parts of the building is thoroughly ventilated, and although the work was wholly night work, and he was thrown continually in close proximity to the motors, belts and presses, of such an establishment, in two years he was thoroughly sound and well, and returned to the north to again take up his occupation of steam engineer.

Many instances could be cited and substantiated of the above nature which have come under the observation of the writer if space permitted, but as it does not I will content myself by calling attention to the fact that the census reports show that during the last decade the health of the principal cities greatly improved and the death rate was considerably lower than formerly.

As the period between 1890 and 1900 witnessed the almost universal adoption of electric traction, and the electric motor in our cities, and millions of our citizens were thrown within the gentle and stimulating (although imperceptible) influence of the motors in their daily rides on the cars, or in the various occupations operated by motors—is it not worth while to consider whether or not the adoption of electricity as a motive power has not had as much to do with improved health conditions in our cities as "improved sanitation," which is usually given all the credit?

J. W. GREER.

Yoakum, Tex., August 2, 1904.

The Current Supplement.

The current SUPPLEMENT, No. 1495, opens with a splendid picture of an exhibit of rock and ore crushing and screening machinery in the Mines Building at the St. Louis fair. The St. Louis correspondent of the SCIENTIFIC AMERICAN describes the machinery briefly yet clearly. From the same pen is published an illustrated article on "Geronimo" and an account of the 1,000-horse-power compound French engine and dynamo at the fair. An excellent picture of the engine in question also appears. An article entitled "The Aeroplane" by M. Rudolphe Sorean, outlines some of the difficulties met with in the construction of an aeroplane flying machine. George E. Walsh writes instructively on "Briquette Fuel Materials." "Sewage Purification" is the title of an article by C. M. Ginther, which is excellently illustrated. Emile Guarini writes on the Krieger electric automobile. Very few are aware of the notable service rendered to farmers and gardeners throughout the entire growing season by the common toad. The usefulness of this despised animal is eloquently set forth by A. H. Kirkland. The report of Mr. W. Ripper, of the University of Sheffield, on observations of the Mosely Educational Commission, begins in the current SUPPLEMENT. Of electrical interest are articles on some new experiments with cathode rays and the Janus telephone system.

Calxia.

Calxia is a new substance destined to take the place of terra cotta and plaster in the majority of their applications, principally with regard to the manufacture of small objects and the covering of surfaces of moderate size.

The various ingredients that enter into its composition impart to it remarkable hardness and cohesion and at the same time great plasticity.

The proportions are as follows:

Water	30 parts
Albumen	10 parts
Sulphate of magnesia	4 parts
Alum	9 parts
Sulphate of calcium, roasted	45 parts
Borax	2 parts
	100 parts

The preparation of the mixture must be conducted with great exactness, otherwise it will lose some of its qualities. First dissolve 10 parts of albumen and 9 parts of feather alum in 30 parts of water, which liquid is used for mixing to a convenient consistency, 45 parts of burnt sulphate of calcium, 4 of sulphate of magnesia and 2 of borax. The product obtained is a paste which is molded by the usual processes. As soon as it has "set" it is placed in a stove at 60 deg. C. It is very important not to exceed this temperature, otherwise the composition will crumble. In order to increase its hardness and to render it inalterable in the air, it is well to plunge it for a minute into a receptacle heated in the water-bath and containing oil boiled with litharge with Carnauba wax added. Then it is again put in the stove to be dried at a temperature of only 35 deg. C. Heat and humidity have after that no more effect on it.

It is easy to give to the piece thus obtained the shades of fired stoneware by coating it with a solution of alcohol and sandarac and sprinkling on powdered sandstone when it is still fresh. The light parts of the color are done with liquid enamels applied cold and placed in the stove at 60 deg. C. The tints are unalterable and adhere very firmly. Any desired effect may be produced and veritable objects of art be created bearing the imprint of the personal taste of the maker and adaptable to decoration in all imaginable forms. These manipulations are productive of appreciable advantages. First of all, this material possesses great solidity, which enables it to withstand shocks which would be fatal to plaster and terra cotta. Nevertheless, it is very light and this fact is of interest when it comes to ornamenting interiors by means of statues, bas-reliefs, friezes, cornices, and various applications, whose weight must needs be limited.

Its great resistance to flexion and traction is utilized in the manufacture of consoles, sockets, pedestals, socles, and tablets destined to support considerable weight.

Finally, a very important advantage possessed by the new substance should be noted, viz., its imperviousness to hot and caustic solutions. At an epoch where antiseptics are more and more becoming the order of the day and dust is pursued by all available means it is indispensable to be able to decorate interiors with objects or applications which can be asepticized frequently and in a thorough fashion. In conclusion, let us state that the low price of the raw materials and the simplicity of the manipulations, which anybody can carry out, reduce the cost of calxia to one-half of that of terra cotta.—La Nature.

Twenty-four ovens in the new Semet-Solvay plant of the Milwaukee Coke and Gas Company have begun operation, and the remaining fifty-six will be started soon. Each of the ovens requires, every twenty-four hours, 7.5 tons of coal, and the product of the twenty-four ovens now runs to about 130 tons of coke a day. When the eighty ovens are in operation, the daily product will be between 450 and 500 tons. The gas now generated by the ovens is being used to heat the newer ones, but there will be a surplus of about 3,000,000 cubic feet a day, of which the company desires to dispose.

The number of furnaces in blast in the United Kingdom for the quarter ended June 30 last was 329, and the estimated make of pig iron for the half-year is 4,218,000 tons.