Correspondence.

Medical Students in Germany.

To the Editor of the SCIENTIFIC AMERICAN:

In the last number of the SCIENTIFIC AMERICAN you make the statement that "the overcrowding of the medical profession in Germany is a matter of grave concern." Allow us to correct this statement through the following statistics. The medical students in Germany reached the numbers stated below in the respective years:

1884-1885	7,844
1887-1888	8,513
1890-1891	8,163
1893-1894	7,740
1896-1897	7,785
1899-1900	7,022
1902-1903	6,232

—from which figures you will see that rather than increasing, the number is decreasing.

C. BISCHOFF & Co.

New York, November 10, 1905.

Soft-Ground Horseshoe.

To the Editor of the SCIENTIFIC AMERICAN:

I notice in your issue of the 28th instant a sketch of what you call a "soft-ground horseshoe," recently invented. This reminds me of an appliance used by my father during the 50's, on mules that were used for plowing and harrowing lowland rice fields on Clarendon Plantation, Brunswick County, N. C., on west side of the Cape Fear River, five miles below the city of Wilmington, N. C.

These lands are so soft in many places that horses or mules cannot walk across them without sinking. The boots, as we called them, were first made of heavy sole leather with wide, round bottoms, and extended up around the animals' fetlocks, where they were made fast with straps and buckles. These were a failure. When the leather became saturated with the water it would double up and not support the weight of the animal. My father then made them of wood—black gum—at much smaller cost, and used them for years with perfect satisfaction. He was the first planter to use them in this State, and I think in the South. There was no patent on them; all who wanted to made and used them. It was the only way that mules could be worked in many of the rice fields.

It was very amusing to watch the antics of a mule with his first "set of boots" on. The modern clog dancer ain't in it a little bit.

The mules intended for this work were fitted with the boots and allowed to loaf on the high ground until they became accustomed to their boots before they were put in the soft land. JOHN S. WATTERS.

Charlotte, N. C., October 29, 1905.

The Curious Behavior of an Incandescent Lamp.

To the Editor of the SCIENTIFIC AMERICAN:

While experimenting with a disconnected incandescent lamp bulb last week, I knocked off the tip to note the retarding effect of air on the vibration of its carbon filament, which thus remains active only 1-200 part as long as when in a vacuum. At the moment of the inrush of air, which in this case, due to the size of the puncture, was about a half second in time, I was startled by a shock like a current which passed through the hand grasping the brass terminals, which also continued for one-half second. The lamp was an old one, with a break in the filament, and I subsequently tried a dozen others—all old—to repeat the effect, but only once could another but slight current be perceived. The first lamp had for about fifteen minutes before been charged by an electrified belt, but of course again discharged, certainly absolutely, as must result by handling for some minutes, and therefore this was repeated in some of the tests made afterward. In both successful incidents it happened, therefore, that the lamps were subjected to the influence of static electricity. I had formed the theory that the electricity set free was due to friction of the air current on the filament and that whenever results were obtained it was due to the former striking the latter squarely and when this was nearly complete. The lamps used were of the double-loop kind and of 16 candle-power. The current was of an irregular, vibratory nature, which appears to presuppose that the trembling of the filament loop was concerned in the effect. In exact language, what was the cause of this electricity?

Brooklyn, N. Y. ALBERT F. SHORE.

Mosquitoes and Yellow Fever.

To the Editor of the SCIENTIFIC AMERICAN:

Does the *Stegomyia fasciata* die or lose its power on the fall of frost?

Does the *Stegomyia fasciata* lose its prepotency in intervals of years or months (*vide* the outbreak of fever at the towns in Nicaragua and Honduras)?

Is it not a fact that the mosquito is worse in cool or cold weather than in hot?

Where is the inceptive in yellow fever—in the man or the insect? Is there not a commencement?

Is it not possible for two or more gases, each innocuous, combined to form a third or fourth gas toxic?

If filth is no factor, why the preliminary cleaning up, at such a loss of time or money?

Does the difference in atmosphere between closed rooms and open beds play no part in the transmission?

Does receptivity of patient count for nothing?

Does the difference in the virulence of the attack under similar conditions amount to nothing?

Finally, is the *Stegomyia fasciata* more delicate than other species of mosquitoes? If so, what of the ovum—or the original fasci in the commencement?

Suppose an unimpregnated *Stegomyia fasciata* lives through the winter—is he capable of conveyance? His life is at furthest 120 days. In the cold, or semi-cold months, is he incapable of transmission? Does heat, moisture, or other unknown cause play no part? In other words, is the *Stegomyia fasciata* the *sole cause?*

I make no comment. I have lived in New Orleans and other Southern cities through fever epidemics; have noticed the bites in epidemics, and when there were none. Know, but will say nothing of the continuous activity of the mosquitoes. Make no postulate, but ask for information. WILLIAM F. WILSON, M.D.

Port Lanaca, Tex., September 24, 1905.

Automobile Notes.

To prevent the freezing of the cooling water for gasoline motors in temperatures down to 0 deg. F., it is advisable to mix with the water about one-quarter its volume of wood alcohol.

By his arrival in San Francisco at 9 A. M. on October 30, W. C. Chadeayne broke the transcontinental motor bicycle record of 48½ days, originally made by George A. Wyman. Chadeayne left New York Septemper 13, at 9.25 A. M., and taking into consideration the difference in time, he was just 47 days, 11 hours, and 35 minutes making the trip. The machine he rode was a Thomas "Auto-bi" with a belt drive. On account of snow and sandy roads, he was obliged to ride over the railroad ties a good part of the way during the last two weeks of his trip. He also rode several nights by moonlight in order to gain time. His experience at this time of the year was a particularly trying one, and both he and his machine deserve great credit.

The postal service is using a form of electric automobile mail wagon in Milan, and it appears to be quite an improvement. The new postal car, following the lines of the Paris system, which we illustrated not long since, runs between the central post office and the branch offices and boxes in the different districts of the city. The car is built by an Italian firm, but it differs considerably in construction from the Paris car, in the fact that the main part of the automobile is of large size, on the style of an omnibus, and is fitted out so that the mail can be sorted by the employe while the car is running. The car stops at each letter box to collect the mail, and between the boxes the employe sorts and stamps the letters and passes them in packages to a second man who puts them in a series of compartments corresponding to each postman's route. All the boxes are collected within an hour and a half, with a total run of 14 miles. It is proposed to extend the use of these cars all over Milan.

A new electro-chronograph for timing races has been devised by Mr. D. Owen, lecturer in physics at the Birmingham Technical school. The apparatus comprises a revolving drum which rotates at a uniform speed. The surface of the drum is smoked, and on it presses a style in connection with an electro-magnet which travels parallel to the axis of the drum as the latter revolves, thereby supplying a spiral trace on the drum. The electric circuit includes a target switch and a tape switch, which are united by a metallic lead and return wire. The starting pistol is fired at the target on the target switch, thereby opening the circuit and lifting the style momentarily from the drum. When the tape is reached and broken the same action takes place, and the number of revolutions of the drum between the two breaks is then read off. The timing of the speed of the drum is made electrically under the actual conditions of the race by placing the electro-magnet of the chronograph in connection with a pendulum or clock, which is made to give a mark on the revolving drum at intervals of one second. A ten-second race can thus be timed with certainty to one-fiftieth of a second.

The Bishop of Salisbury has lately adopted the automobile, and not long ago he was seen on his way to the assembly at Weymouth in his new car. Following his example, no doubt many other members of the clergy will take up the modern method of locomotion. One case we may mention at least. It seems that at Liverpool the members of the congregation have raised the sum of $6,000 by subscription, for the purpose of allowing their pastor, Mr. Chavasse, to purchase an automobile. This will enable him to visit the outlying parts of his district very easily. Among the sovereigns who have taken up the automobile lately is the King of Siam, who after taking his ministers around in a car over the rather rough roads of the country, has now made the purchase of a De Dietrich 16-horse-power chassis at Paris. Upon the chassis he will have mounted a special carriage-body according to his ideas. The Prince of Bulgaria, who does not hesitate to go in for all kinds of sports, even riding on the locomotives, is a fervent admirer of the automobile, and when last at Paris was often seen driving about the boulevards and parks.

The automobile appears to be making considerable progress in India and Indo-China. This was brought out in a striking manner by the great touring race from Delhi to Bombay over an 850-mile course. In Indo-China the cars are coming into use in many places, especially in the large cities. The wealthy residents of Kuala-Lampur, one of the principal cities of the region, lying toward the south in the state of Selangor, now own a number of cars and they are very popular here. But the greatest future lies in the direction of industrial cars. The region possesses large gold mines, also an abundant supply of iron and tin. The principal exportation products are spices and gum. But owing to the lack of railroads, which are difficult to construct, little has been done toward utilizing the riches of the country. Industrial cars are now being introduced in the region and they will no doubt be of great value. The De Dion-Bouton hauling car which takes a 1½-ton load has already proved a favorite and before long we may see many of them in use. Should a public service of automobiles be organized, this would bring about a considerable importation of rice, cotton goods, coal and oil, etc., into the region.

At a recent meeting of the Académie des Sciences M. D'Arsonval gave a description of a new device for observing the speed of a motor. This apparatus, which is simple and practical in its character, has been brought out at Paris by the Richard firm, the well-known instrument constructors. Unlike most speed-indicating devices, it is intended to show the variable change of speed which a motor may have from the normal at any instant, comparing it with the speed of a standard motor which has a uniform movement. The standard of comparison in this case is a clockwork device which is provided with a speed regulator, so that its movement is practically constant. A uniform rotation is thus communicated to a pair of friction plates mounted on a shaft and acting on a roller whose distance from the axis of the plates is regulated by a milled screw. The friction roller gives a greater or less speed to one of the wheels of a differential mechanism. The other wheel of the differential is operated by the motor which is under trial. By regulating the position of the friction roller by the hand screw we can bring the first wheel of the differential to the mean speed at which the second is running, and for the standard speed of the trial motor the two wheels of the differential will run at the same speed and the apparatus itself will then remain at rest. Variations of the trial motor from the standard speed are seen by an indicating needle which is placed on the movable part of the differential. The Richard apparatus in its present form is so designed that an angular displacement between the motor shaft and the clockwork shaft represented by 1-250 of the circle is shown by a movement of 0.12 inch of the needle upon the dial, but the scale can be read down as close as 0.02 inch. Such an instrument will no doubt be valuable in different kinds of testing work, especially as it is of simple construction and easy to operate.

Temperature and Weight.

L'Illustration (Paris) propounds and solves the following little problem in physics: Does any body whatever, warm, weigh as much as, more, or less than the same body cold? Note that this may have importance in the physics of the globe. The attraction between bodies which is shown in gravitation might change and vary. The ideal would be to be able to measure this attraction between identical bodies at very different temperatures; but the experiment can hardly be made, so an English physicist, Mr. Poynting, proceeded otherwise. He sought to see if a body whose weight we have taken in the scales at a given temperature preserves the same weight at another temperature, much lower or higher. The experiment is delicate and demands great care. It showed that the solid body heated to more than 100 deg. C. is a little lighter than the same body at 15 deg. The difference is very slight—0.003 milligramme in a solid of 208 grammes weight. In a general way, the difference in weight is not even as 1 to the tenth power of 10 for a difference of one degree in temperature. The difference exists, but it is infinitesimal. During the heating or the cooling of the body experimented on, there occur pretty considerable (apparent) variations in weight; but this is ephemeral. The heated body, which at first seems to lose a pretty important proportion of its weight, recovers the greatest part of it and shows itself, once heated, to have a weight only very slightly inferior to that which it had at low temperature.