MLLE. SCHULTZE, DOCTOR OF MEDICINE OF THE FACULTY OF PARIS.

"Mademoiselle, you are beautiful, you are young, you are well informed, you are courageous, you have everything in your favor. Although I do not share all the ideas which you advocate, I render justice to the talent with which you have defended them."

Prof. Charcot spoke thus at the reception of Mlle. Caroline Schultze to the grade of Doctor of Medicine, and we who were present were of the opinion of the learned professor of the Salpetriere. Nothing could be more charming, by contrast, than the sight of this beautiful young woman with black eyes and a brilliant complexion, who, wearing the black robe of the candidates and surrounded by her bearded colleagues, argued before a jury composed of men eminent in science, but rather less dignified than usual in spite of the pomp and display of red robes and robes laced with gold.

Ordinarily, in the case of common mortals, students, the members of the jury are content to question the candidate on the subject treated, which is always a question of medicine or the object of personal medical work; and finally, the discussion finished, and accompanied by the traditional congratulatory discourse, the future doctor is declared worthy or unworthy to enter the corporation. This time it was an entirely different affair.

The candidate was a woman of 22 years, a person young and pretty, who not only discussed a medical subject, but supported a theory which still divides the learned faculty into two camps.

The subject of Mlle. Schultze's thesis was "The Female Physician of the Nineteenth Century," a subject which the candidate, it must be acknowledged, supported in a brilliant manner, demonstrating perfectly that, in the near future, woman would have an important place in the medical world, and that the female practitioners would take their stand with the male practitioners. "The second half of the nineteenth century," she said, "has been marked by a general movement of intellectual and professional emancipation for women. All civilized nations have formed their feminine contingent in the study and practice of medical sciences. Everywhere women, who have fought in the advanceguard for their intellectual and professional emancipation, have had difficulties of all kinds to overcome; but everywhere, up to the present at least, they have been victorious."

We have said that Mlle. Schultze is 22 years old. She was born at Varsovie, Russia, belongs to a family of musicians, and at the age of 17 desired to give herself up completely to scientific studies. Finding herself under the Russian law which does not allow women access to any school of medicine, she went to Paris to pursue her medical studies. Less than five years have been sufficient for her to finish her task well and obtain the diploma of "Doctor." Armed with this title, she will establish herself in Paris (in her thesis she thanked France for the hospitality extended her and called it her adopted country), with the intention of devoting herself exclusively to the diseases of women and children.

"You have been my pupil, and I appreciate, not only your instruction, but the rapidity and surety of your diagnoses." Prof. Landouzy finished with these words. The assertion of the learned professor is a sure guarantee of the success of the young physician.—*L'Illustration.*

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The Ways of Lawyers.

The *Boston Journal* relates a good story of a prominent legal firm in that city, which does a great deal of business for a rich mercantile concern. It lately rendered a bill which the senior partner of the mercantile establishment (who was accustomed to liberal charges) thought was too high. He, therefore, took the bill to the law firm and asked the chief to look it over and see if it was all right. The account was subsequently returned with $10 added for "advice as to the reasonableness of the bill."

SIMPLE EXPERIMENTS IN PHYSICS.

BY GEO. M. HOPKINS.

Color is a sensation due to the excitation of the retina by light waves having a certain rate of vibration. Those having the highest rate capable of affecting the eye are perceived as violet, while those of the lowest rate are perceived as red. According to Ogden Rood's "Modern Chromatics," the rate of the former is 757 billions of waves per second, that of the latter is 395 billions of waves per second, and between these extremes are ranged waves of every possible rate, representing as many colors. When light waves of all periods are united there is no color—the light is white. Newton discovered a way of resolving white light into its constituent colors. He made exhaustive experiments with prisms, first producing the gorgeous array of colors known as the spectrum, then recombining the colored rays by means of another prism producing white light. He found that the colors of the spectrum were simple, *i. e.*, they could not be further decomposed, and he also demonstrated that the red rays were the least and the violet rays the most refrangible.

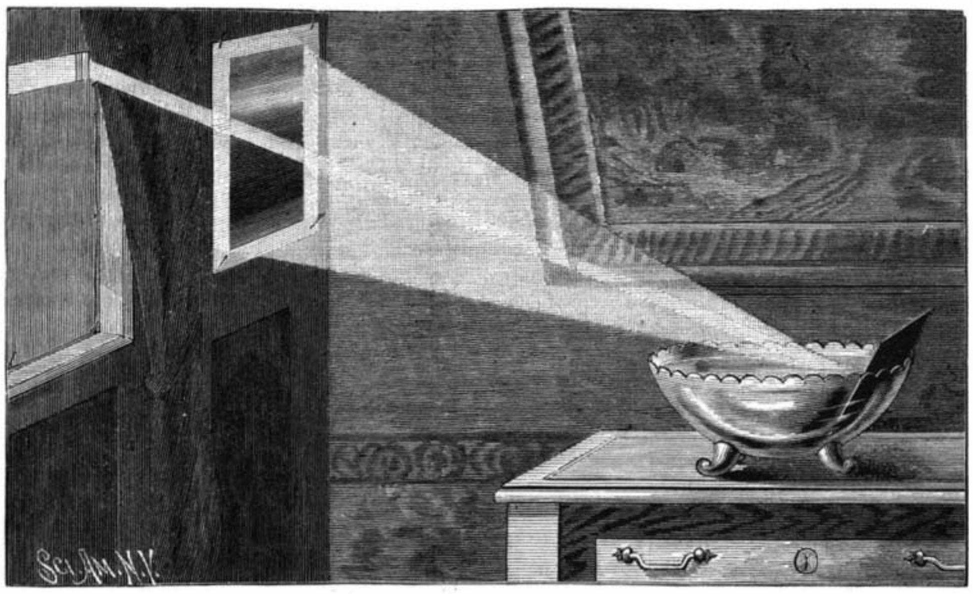

Fig. 1.—SIMPLE APPARATUS FOR PRODUCING THE SPECTRUM.

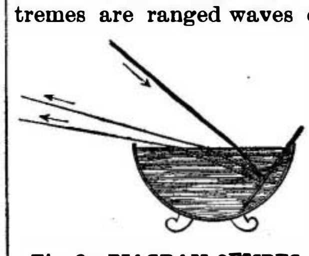

Fig. 2.—DIAGRAM OF SPECTRUM APPARATUS.

The solar spectrum is always a delight to the eyes of every person having normal eyesight, and it is a simple matter to produce it by means of a prism. When a prism is not available, it may be produced in the manner illustrated by Figs. 1 and 2. This method is inexpensive, and yields a large spectrum. The materials required are a piece of mirror, five or six inches square, a dish of water, and a sheet of white paper or a white wall. The mirror is immersed in the water and arranged at an angle of about 60°; this angle, however, may be varied to suit the direction of the light. The incident beam received on the mirror is refracted on entering the water and dispersed. It is further dispersed on leaving the mirror, and still further upon emerging from the water. By causing the reflected beam to strike obliquely upon the white paper or wall, the spectrum thus produced may be made to cover a large surface.

Should the sun be too high or too low, the proper direction may be given to the incident beam by means of a second mirror held in the hand. The diagram, Fig. 2, shows the direction of the rays.

Some very interesting absorption experiments may be made in connection with this simple apparatus. For example, colored glass, or sheets of colored gelatine, may be placed in the reflected beam. If red be placed in the path of the beam, red light, with perhaps some yellow, will pass through, while the other colors will be absorbed, and will not, therefore, appear on the wall. With the other colors the same phenomenon is observed. Each colored glass or gelatine is transparent to its own color, but opaque to other colors.

In a similar manner a piece of red paper or ribbon placed in the red portion of the spectrum will reflect that color, but if placed in some other part of the spectrum it will appear dark, the other colors being absorbed or quenched by the colored surface. It is seen by these experiments that when light passes through a colored glass or film, it is not all colored. It is simply a matter of straining out every color except that to which the glass or film is transparent. In reality only a small part of all the light striking the colored glass passes through it. In the above experiment it is essential to avoid all jarring of the water, as ripples upon its surface defeat the experiment. If it is impossible to so place the dish as to avoid jarring, the ripples may be prevented by suspending a transparent plane glass horizontally, so that its under side will just make contact with the surface of the water.

Experiments with Tempered Steel.

B. Pensky, after experimenting with two steel rods 100 mm. in length, observed, says *Industries*, that they exhibited an increase in volume after they had been tempered by heating to redness and plunging in water. This he attributes to the fact that the external layers solidify first, and consequently prevent, to a certain extent, the contraction of the interior mass during cooling. The length of the rods under these circumstances showed a variable behavior, inasmuch as one of the rods, 27 mm. thick, increased in length 0·083 mm.; while the other, 13·5 mm. thick, decreased in length 0·030 mm. It would thus seem that a rod when tempered becomes longer or shorter according as the proportion of surface to volume is either below or above a certain limit. Subsequent to the tempering, both rods became gradually shorter at the ordinary temperature, the decrease in length amounting to 0·032 mm. and 0·021 mm. respectively. When they were now heated to 120°, they underwent a further diminution in length amounting to 0·015 mm. and 0·021 mm.; but further exposure to the same temperature produced no alteration in the length. On the other hand, by subjecting the rods to successively rising temperatures, continued shortening was observed. Very hard steel disks suffered similiar decrease in the length of their diameter, gradually at ordinary temperature, but more rapidly after being heated.