sucking the wound (usually the patient himself) to spit out all the matter so sucked, and to freely wash out the mouth with water; should the wound be a punctured wound, make a crucial incision, promote and encourage bleeding, and treat as above." Mr. Mackellar condemns the use of nitrate of silver, and says the pain caused by the phenol is of short duration.

— *La nature* recommends the following method of cutting thick glass tubes: wind an iron wire half a millimetre in thickness around the glass tube, and connect it with a galvanic battery of sufficient power to raise the wire to a red heat; then put a few drops of water near the wire upon the glass; the latter will then crack in the direction of the wire, and, the thicker the glass, the more exact will be the fracture.

— Ten thousand cases of cholera occurred in Japan during the first six months of this year, of which 7,803 were fatal. During the preceding six months, 12,000 cases occurred, with 7,152 deaths. The disease is now prevailing in Osaka and Yokohama, the mortality varying from sixty to seventy-five per cent.

— The monthly bulletin published by the New York state board of health contains the following vital statistics: the reported mortality throughout the state during the month of June was 6,336, of which 35.3 per cent were under five years of age; 1,220 deaths were due to zymotic diseases, or 193.65 in 1,000 total mortality; the ratio per 1,000, of deaths from typhoid-fever, was 6.20; from diarrhoeal diseases, 73.80; from croup and diphtheria, 60.32; from consumption, 144.60.

— The examination and criticism of the last annual report of President Eliot of Harvard, that Prof. Andrew F. West of Princeton published in the *Independent*, has been issued in pamphlet form. It is chiefly devoted to refuting President Eliot's arguments in favor of the elective system as practised at Harvard.

— The collection of *Mémoires et documents scolaires publiés par le Musée pédagogique*, under the auspices of the department of public instruction in France, is to be enriched by a learned and curious *Répertoire des ouvrages pédagogiques du xvi^e siecle.*

— The *Journal des économistes* has been publishing articles describing the principal economic publications of the world. In a recent issue, M. Maurice Block, member of the institute, reviewed the publications other than French, and gave a most flattering notice of the *Political science quarterly* recently started by the faculty of the school of political science, Columbia college.

— Where accuracy is desired in the measurement of liquids, 'spoons' and 'drops' should be discarded. The ordinary teaspoon, which is presumed to hold a dram or sixty minims, in reality holds eighty, and can with a little care be made to hold one hundred and twenty minims, or twice what is ordinarily attributed to it. A drop is also a very indefinite quantity, — a fact of which any one can satisfy himself by dropping an equal number of drops of molasses and alcohol into a measure of known capacity, and comparing the amounts. The size of the drop is also materially affected by the vessel from which it is dropped. The 'minim' is a definite quantity, sixty of these making a dram, and should always be used, especially in dispensing medicine.

— The *Journal of reconstruction* states that an infant loses from three to six ounces in weight during the first four to six days after birth; by the seventh day it should have regained its birth-weight; from that to the fifth month it ought to gain about five ounces per week, or about six drams a day; after the fifth month, about four drams a day; at the fifth month it ought to have doubled its birth-weight, and in sixteen months quadrupled it.

— Carl Meyers made from the fair-grounds in Franklin, Penn., on Wednesday, Sept. 8, the first ascension known with natural gas, the balloon rising just one mile, and sailing about one hour.

LETTERS TO THE EDITOR.

***Correspondents are requested to be as brief as possible. The writer's name is in all cases required as proof of good faith.*

Psychophysics.

MR. HYSLOP, in his article on 'Psychophysics' in *Science* for Sept. 17, charges the writers on that subject with laying claim to a scientific accuracy which they do not possess. Any such charge as this manifests so plainly a misconception of what psychophysics really professes and attempts, that a word of defence seems to be in place. The conclusion was drawn from the alleged incorrectness of Fechner's mathematical statement of the psychophysic law. From some admissions of M. Ribot regarding the same, Mr. Hyslop concludes that "such admissions prove fatal to any such exactness as is enjoyed by the physical sciences." Aside from the question of the truth or falsity of Fechner's statement of the law (Mr. Hyslop queerly admits that it is true), let it be observed that psychophysics, so far from professing to be a mathematical science, does not profess to be a science at all; but it does modestly claim to pursue a scientific method. This method, which, as Wundt explains, is peculiar to the physical sciences, is the experimental method. It does not differ from the old psychology, as Mr. Hyslop thinks, so much in having discarded introspection. Any psychology, even physiological psychology, must, by the nature of the case, be introspective. It differs fundamentally in this: that whereas the old psychology assumed the

dictata of *consciousness* to be the whole sphere of psychology, started with these and reasoned out a complete so-called science, the new psychology modestly starts with physiological experiments, and records the psychological results. It works from without inward. It begins with external conditions which it can control, and, by subjecting these to as exact and accurate measurements as are known in modern science, it observes the corresponding mental phenomena. We can conceive of almost any other criticism being brought against psychophysics than that it is unscientific or inaccurate. Whether it is a fruitful study, or has thus far repaid the immense labor expended upon it, may be questioned; but that it is characterized by the most patient research, the most precise measurements, the most cautious conclusions, and a scientific spirit that the old psychology never approached, cannot be reasonably denied.

As regards the psychophysic law of Weber, under the following statement it has been generally accepted, and found useful and suggestive: "The difference between two excitations, must, in order that the differences in sensation be equally appreciable, grow proportionally to the magnitude of the excitations." The mathematical statement of the same by Fechner — "The sensation grows as the logarithm of the excitation" — has given rise to the question whether differences in sensations can be expressed in terms of quantitative measurements. This objection is urged by Zeller, and rejected by Wundt. It implies the old error of a physical world without, and a spiritual world within, which have nothing in common. While Wundt's position here is theoretically correct, the question may nevertheless be raised, whether, ultimately, differences in sensations are not qualitative rather than quantitative differences.

GEO. T. WHITE.

Science for a livelihood.

I have just read the communications of C. B. of New York and W. F. Flint of New Hampshire in Nos. 188 and 189 of *Science*, under the above heading, in which there is a strain of lament over the frugal table which the field of science has spread for ambitious young men who desire to live, or at least exist, on a purely scientific diet. As I deem the subject of vital interest to nearly every young man with scientific tendencies about to choose a profession, I desire to add a few words.

I graduated in the spring of 1884 from a scientific department of the Kansas state university. After taking a pretty thorough general course of study as an undergraduate, I finished my work by spending two years in the Natural history laboratory, under the direction of Prof. F. H. Snow. If I did not receive a 'good' or 'first-rate scientific education,' I did, at least, master a few principles, and laid a foundation for future work and study. During my last year in the laboratory, I had the refusal of two positions as teacher of natural history, both of which paid good living salaries. Within a year's time after graduation, I was offered three positions, with no salary less than twelve hundred dollars. Meanwhile I had not made a single application for a position.

George F. Gaumer, Annie E. Mozley, and Richard Foster graduated from the same department while I was in the lower classes, and all three have held good positions. Gaumer went to Cuba, then to Yucatan, and afterwards to various parts of Central America. On his return, after an absence of three years, he reported fine success, particularly in a financial way. He cleared twenty-five hundred dollars by selling specimens of the golden turkey, and increased his finances in various ways as a collecting naturalist. But this was only a small part of his success. He collected many rare birds and insects, some of which were new to science, and returned with a reputation as a rising young naturalist, to receive an appointment as professor of natural history in the University of Santa Fé, New Mexico. Richard Foster speaks for himself as professor of natural history in Howard university, Washington, D.C.

W. C. Stevens graduated from the natural history department in 1885, and immediately received a good position as a teacher of natural history. J. D. McLaren graduated from the same department with the class of '86, and in less than a month's time his scientific training secured him a position as teacher at a hundred and fifteen dollars per month. W. H. Brown, member of the senior class, who has spent but a single year in the department, went to the Smithsonian institute to spend a month of his summer vacation, and learn what he could by observation, expecting to return, however, and resume his work in the laboratory. But, alas! news soon came that his enthusiasm and skill had secured him a good place with increasing wages.

As much, if not more, might be said of the students of the other scientific departments of the university. All the graduates from the 'course in chemistry and physics' are professors enjoying enviable positions as well as good salaries. Many of the advanced undergraduate students from this course hold respectable positions, and receive good wages.

I must be brief as possible, but not so brief as to omit the civil engineering department, the graduates of which receive larger salaries, perhaps, than those laboring in other scientific fields. The most surprising thing about this department is, that there is such a present demand for the young men, that nearly all of them are called into the field to hold responsible positions, and receive remunerative wages before they have finished their work in the department.

As regards the 'wealth' and 'friends' of the young men of whom I have spoken, allow me to say that all of the graduates, with a possible single exception, were farmer boys who earned with their own hands most if not all the money which kept them at the university. And the only 'friends' they had 'to forward them in their chosen fields' were those which industry and good progress won for them in those fields.

I think the facts will bear me out in saying that no class of Kansas young men are doing better, or have more brilliant prospects, than those which have done good work in the scientific departments of the university.

L. L. DYCHE.

Lawrence, Kan., Sept. 20.

Photography of the solar corona.

Accounts have appeared in your journal, of my attempts to photograph the corona of the sun without an eclipse. Many of the plates obtained presented appearances which, not to myself only, but to several scientific men who must certainly be considered to be among those who are exceptionally competent to give an opinion on this point, seemed to be most probably due to the corona. Plates taken in England about