

106½° Fahrenheit. The disorder is not fatal, it hardly requires any treatment even; only in debilitated or very old animals, or such as are overworked by inhuman owners, may fatal complications arise. Few deaths have taken place; a veterinarian in Yorkville who has visited stables containing an aggregate of a thousand affected horses, has had but a single death, that of an animal overdriven while convalescing, and in which pulmonary congestion resulted.

There is as yet no proof that the affection is contagious; it is rather endemic than epidemic. The rapidity with which it has successively appeared in Boston, New York and Chicago, speaks more in favor of an atmospheric cause than of transmission by contagion. A Boston microscopist asserts that bacteria or micrococci are active factors in its transmission, but he makes the statement, rather as an inference, than on the basis of observation. The same veterinarian, to whom we owe the communication of several facts here mentioned, tried to inoculate his own horse with the disease, by introducing the discharged matter from sick horses into its air passages, and failed in this and other experiments of the same kind. It is also observed that the endemic has appeared more frequently and affected more horses in large, well ventilated stables, in which the influence of outside changes in the temperature is quickly felt, than in close and confined quarters where the air is, if more impure, warmer, and the oscillations of the outside temperature less suddenly made manifest than in the former.

As far as this city is concerned, the *acme* of the endemic is past, and owners of horses frightened by sensational reports in the daily papers are recovering their wonted composure. If it has done nothing else the distemper has taught the one lesson, that when a horse is ill, the policy of getting as much work out of him as possible is, not to speak of its barbarity, exceedingly short-sighted, for no vigorous animals have perished in this endemic, except such as those in whose case this "penny wise, pound foolish" idea had been carried out.

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PROFESSOR EDWARD C. PICKERING, of Cambridge, describes a novel celestial object observed by him on the 28th of August last, which presented a faint continuous spectrum with a bright band near each end. Clouds interfered, and barely permitted an identification with Oeltzen 17681, or a position in 1880 of R. A., 18h. 1m. 17s.; Dec., 21° 16'.

The object might be mistaken for a temporary star, like that in Corona in 1863, and the bands assumed to correspond to the Hydrogen lines C and F. Professor Pickering appeared to be unable to determine

whether it was a nebula, a mass of incandescent gas resembling a nebula in character but not in constitution, or whether it was a star with a vast atmosphere of incandescent gas of a material not as yet known to us. The discovery of this object, in his opinion, greatly increases the difficulty of distinguishing between a star and a planetary nebula.

The observation was made on the 24th of August and described on the 2d of September, but in consequence of the fact that Professor Pickering sent his communication to a foreign journal, three thousand miles away, it was thus the second week in October when it came before the American public.

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#### SCIENCE IN FRANCE AND GERMANY.

Dr. C. K. Akin has written a series of letters from Pesth to Professor G. C. Stokes, Secretary to the Royal Society, who was one of the Royal Commission on Scientific Instruction. These letters are dated 1870, but are now published for the first time by *The Journal of Science*, London.

In what may be called a supplemental communication Dr. Akin describes the condition of the most prominent scientific institutions in France and Germany. His remarks on the system of centralization, and abuse of the authority of those who profess an infallibility in respect to the human mind will be read with interest.

He states that these scientific magnates, the recognized "authority" in Germany, instead of rendering encouragement to students, positively check and impede all progress outside of their own circle, keep out new men with novel ideas as long as possible, so as to hold their own sway.

But we will leave Dr. Akin to make his own statement:

"The French Academy is in some respects similar to the Royal Society, and the points in which it differs from the latter are not, in my opinion, to its advantage. In the first place, the members of the Academy are salaried by the Government, but their emoluments are not sufficient to live upon, or to keep them, so to speak, in working order; nor do they perform any specific service to Science or the State for the money. The Academy, next, is divided into a certain number of sections, according to the several branches of science, and the number of members in each section is strictly limited. As that subdivision is invariable, while the relative importance of the sciences is fluctuating, the abuse has crept in of electing members into a wrong division. On the other hand, such a proceeding not being always practicable, highly distinguished men are excluded from the Academy for many years if their proper sections happen to be full; while if, from the dearth of cultivators or accidents of mortality, the number of vacancies happens to be great, the standard of admission is considerably lowered. The Academy publishes weekly its proceedings or "Comtes Rendus," which, from the celerity and regularity of their publication, are a valuable means of conveying rapid information; on the contrary, its transactions or "Memoires" are issued in a very irregular and dilatory manner. The practice of examining and reporting upon communications submitted has fallen into almost complete disuse; and the prizes, which are in a considerable number, are in a great part awarded upon the antiquated principle of putting forth questions. I have thus rapidly drawn the most distinctive features of the French

Academy, roughly yet faithfully; and I feel constrained to confess my inability to comprehend the enthusiasm which there appears to exist in certain quarters in England for this institution, and which shows itself in the desire to copy it. I have dwelt in a former letter upon the functions which any society should perform in order to be called useful, and I cannot bring myself to believe that those of the French Academy correspond in any way to the model.

I have spoken, in a former communication, in words of unavoidable eulogium, of the German Universities and the position which they occupy among similar institutions in Europe. Still I do not find in their organization anything that I should be prepared to recommend for imitation or adoption. I shall presently mention the mischievous effects which the Universities in Germany, like the Academy in France, exercise on scientific development, according to my belief, when I shall enter upon the discussion of the principles which underlie the organization of both: here I wish merely to give an opinion upon the institution of so-called *privat-docenten*, which is generally considered as most characteristic of the German University system, and which has many admirers out of Germany. A *privat-docent* is simply a lecturer who, as a rule, receives no pay from government or the University, but may take fees from the students: he is simply a private tutor, who, in consideration of having passed an examination or other ordeals before the proper authorities, is admitted to the use of the public lecture-rooms. In my opinion the fellowships in the English Universities—if only Fellows were elected upon a better principle—are much more advantageous; and if the now somewhat dormant institutions of lecturers and prælectors in the colleges were more largely developed, the English Universities would have nothing to envy from, and much to boast over, those of Germany in this respect.

The principal aim of the German Universities, as well as of the French Academy, is to uphold the principle of *authority* in science, which has a great many effects that are detrimental to its progress. Authority in science means infallibility, and it means also stagnation. But the essence of science is development, which is identical with change, and variation from ancient theories or received doctrines. The French Academy has generally not been favorable to novelties started out of its own precincts, as is shown by its treatment of such men as Fresnel, Fourier or Melloni. I know also of a case in which it was found impossible to get a correction or mention of mistakes, which one of its members had happened to make, inserted in the proceedings of the Academy, notwithstanding repeated attempts. The desire to have this done was supposed to imply *naïveté*. In a similar way the German Universities enforce a certain uniformity in the preparation of scientific students, and they measure all ability by a fixed yet arbitrary standard. Investigation must be *schulgerecht*, as it is called—for which the French have the word *classique*, but I doubt whether there be any real equivalent in English. A mind of independent character or original turn has thus a hard struggle for existence; for, in order to get recognized, it must be fashioned on the approved pattern. Men like Davy or Faraday are consequently unknown to the history of German or French science, as their irregular preparation would have debarred them from coming under notice, and still more so from making their way. On the other hand, great errors are propagated and kept up under the wing of authority; and if once a philosopher has obtained a certain sway, or formed a so-called "school," his teaching will be kept up long after its errors have been detected. Thus certain theories are still taught all over Germany in physics which are manifestly untenable, and to attack them is punished more severely

than heresy is in religion nowadays. Theories propounded by new men are generally overlooked. On the other hand, I could tell an instance in the recent history of physical science where a discovery undoubtedly not novel and manifestly incomplete has been accepted on the Continent as an unexpected revelation proof against all doubt, because it was appropriated by names possessing authority. What constitutes authority in science it were difficult to define; yet its worship, although it be opposed to the very spirit of science, is in Germany and France, so to speak, without bounds. It were easy to prove by example that the test of infallibility is not applicable, if such a thing could be imagined with respect to a human mind. Not only are the instances numerous where the authorities of one age have been scouted by those of the succeeding, but even in the works of the greatest among them, whose reputations were acquired on the strength of real intellect and conspicuous services, schoolboys nowadays frequently may point out glaring mistakes committed or upheld by great masters only one generation behind.

I have mentioned in a former letter the well-known fact that a German philosopher who wished to bring out some novel theory in his country encountered so many difficulties that he absolutely went mad. Another who started similar ideas about the same time, having been repulsed in one quarter, took it for granted that the same had happened to him also in another, where it was not the case, so hopeless did he consider his endeavor to obtain a hearing. Actually these ideas took wing in England, but not before, communicated also to the French Academy, they had been allowed to rest unnoticed in its archives for years (like the memoirs of Abel), notwithstanding repeated instances to have them examined. I also have it out of the mouth of one, who is actually himself a chief authority on physical science in Germany, that an early work of his, now the principal foundation of his fame, had proved injurious to his university career, for being of too novel a character. It is a slight consolation to the individuals concerned, for the anxiety or pain they have suffered, to have had their names recently enrolled on the list of members of the French Academy, or to have received an honorary title from a German University; and the damage which is done to science by such proceedings, in all cases serious, is in many irreparable. Authority, whether exercised by academies or universities, would have its uses if it facilitated the endeavors of students during the early and more trying periods of their career, in which encouragement and aid are most welcome and needed; but if, instead, it check or impede novices, and establish merely a kind of confraternity, the chief end of which is to keep new men out as long as feasible, and to uphold its own sway, I make bold to say that the liberty of thought reigning in England, notwithstanding its abuses, is a far more valuable safeguard for science, the very life of which is progress. Now, if the Royal Society, transformed into or superseded by an academy, were to arrogate to itself that kind of domination which the Académie des Sciences exercises in France, or if the English universities endeavored to absorb all the intellectual life of the nation, or to fashion it in their own way, as is the case in Germany, the superiority of England, which has made it the head-quarters of scientific progress and the mother country of so many amateurs more distinguished in science than most French academicians or German professors, would probably be gone.

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TOXICOLOGY.—An Italian commission, including among its members Prof. Selmi, is examining the methods for the detection of poisonous alkaloids in the viscera, with especial reference to the so called "ptomaines,"—alkaloids which under certain circumstances may be generated during the putrescence of animal matter.