SCIENCE.

FRIDAY, FEBRUARY 4, 1887.

COMMENT AND CRITICISM.

THE ANNUAL REPORTS of President Eliot of Harvard always contain suggestive reading for those who are interested in the advance and improvement of teaching, as well as in teaching itself. The constant effort to seek out and put into practice better methods of instruction, or methods more in keeping with the needs of the time, has been pre-eminently a characteristic of the present administration at Harvard. This was well pointed out by President Angell of Michigan in his after-dinner speech at the Harvard celebration last November. He alluded to the debt that all American colleges owe to the old university for the bold spirit of experiment that has led to the recognition of the difference in value between the traditional, customary, and conventional methods, inherited from previous generations, and the new, fresh, original methods, that contribute their share to the advance of the age. Any thing, he said, rather than stagnation in educational matters. Certainly there is no stagnation at Harvard, and the many changes of the last fifteen years seem only to prepare the way for more.

One of the present concerns of the college is naturally to secure good teaching for those who may desire to take entrance examinations in science instead of in one of the classics. It is well, therefore, to note President Eliot's attitude on this question. He says, "A serious difficulty in the way of getting science well taught in secondary schools has been the lack of teachers who knew any thing of inductive reasoning and experimental methods." One reason of this is that "good school methods of teaching the sciences have not yet been elaborated and demonstrated, and it is the first duty of university departments of science to remove at least this obstacle to the introduction of science into schools. . . . Science can never be put on the right footing at the university, so long as it is practically excluded from secondary schools, or is admitted only to be taught in a positively harmful way." This brings to the front as important a matter as has lately been considered in the development of collegiate study, and young men may well consider the opportunity that it will open for them. For the next twenty years, the preparatory schools will show a growth on the side of science-teaching, the like of which has not been seen in this country, and really good teachers of chemistry and physics will be in increasing demand. It will be a fortunate university that shall supply the most of these teachers.

An interesting paragraph of the report relates to the "list of publications of Harvard university and its officers, 1880–1885." "In this list, about three-quarters of the 1,813 entries relate to science, including in that term medicine. Very inaccurate estimates of the relative activity in literary and scientific publications of some leading American universities having of late years obtained currency, and perhaps credit, through the public press, it is permissible to remark in the interests of truth, that it would be discreditable indeed to Harvard university — old and well-equipped as it is — if any other American institution could approach it in the range and volume of its annual literary and scientific publications." The excess of scientific publications over literary would be much reduced if pages instead of titles were counted; for in science a larger number of brief monographs on limited topics can be found than there is any equivalent for in literature.

During the last twenty years, while scientific studies were finding their place in the college elective lists, the Lawrence scientific school, once a leader among its fellows, has been steadily losing in number of scholars, and hence in influence. For some years past it has suffered seriously, simply from being overshadowed by the growing college across the street. Some have thought that this meant a discouragement to science-teaching at Cambridge, but the very reverse is the case. When the school was founded, the college was narrow, and saw no propriety in allowing a wide variety of study to its undergraduates. There was no advanced teaching in physical or natural science in the college till 1871, and ambitious students of these subjects in the earlier years had

to go to the Lawrence school for them, if they came to Cambridge at all. Now the same class of students undoubtedly goes to the college, attractive in so many ways, for its lines of study have been extended to include nearly every thing at first found only in the scientific school, in accordance with what is vaguely termed the 'spirit of the age;' but it should be recognized that this spirit has been strongly guided by just such institutions as the Lawrence school, whose graduates include a large number of prominent and influential men. If success is to be measured by the share taken in the labor of bringing neglected studies into their proper position, the liberality of Abbott Lawrence and James Lawrence has been successful even beyond their hopes.

In view of these altered relations, President Eliot recommends that the separate organization of the Lawrence scientific school should be discontinued; that the college faculty should be intrusted with the function of recommending to the governing boards candidates for the degree of bachelor of science; and that the academic council of the university should recommend candidates for the graduate degree of civil engineer, the underlying degree being either A.B. or S.B. The Lawrences would still be commemorated in the names of certain professorships, although no longer attached to a separately organized school. The first of these recommendations will, it is to be hoped, commend itself to the authorities concerned; for the separate existence of the school is not sufficiently encouraged by its present circumstances, and is not likely to be by any thing visible in the future. The third recommendation is not of a kind to provoke unfavorable action. It is to the second recommendation that the most interested discussion will turn. If it result in uniting bachelors of science with bachelors of arts in one body of alumni, the preliminary examinations and the undergraduate courses of study being equivalent, it will be one of the great steps in the advancement of scientific education at Harvard college.

What may be called the official autobiography of the knights of labor is contained in an article by Carroll D. Wright in the current number of the *Quarterly journal of economics*. To be sure, Mr. Wright is not a member of the order; and we have had other accounts of its genesis before, notably that detailed one published in the large work on the labor-question, edited by Mr. George E. McNeill. But we learn from a footnote that Mr. Wright's article was submitted, previous to publication, to several officers and members of the order, and was by them pronounced correct in all statements of fact. It is this that gives the sketch what we have called its official character. Mr. Wright begins by stating that two fundamental ideas underlie all labor organizations, some choosing one, and some the other. The first of these ideas is that of the association of all men of like employment, and on it the mediaeval guilds and the modern trades-unions were founded. The second idea is of broader scope, and takes no account of particular vocations. It seeks to organize all laborers into a single association, and is of later growth than the idea underlying the guilds and trades-unions. On it the celebrated International was founded, and the no less celebrated knights of labor take it as their starting-point. This second idea is both unsound in theory, and is every day proving itself pernicious in practice. It calls for the division of society at large into classes, and arrays the one against the other. As a matter of fact, no such cleavage of society is possible on any but the most superficial reasoning. In this country, where we recognize no aristocracy of birth, and where the industrial organization is democratic to the last degree, the attempt to so divide society is especially foolish and short-sighted. Though it may create uneasiness and disturbance for the time being, it is in the end certain to fail. If by any chance the advocates of the idea in question should succeed in their endeavor to create industrial classes and to array them against each other, the very first conflict would scatter their house of cards in every direction. It would require a very great turning-back of the wheels of progress to make it possible for the American idea of individual liberty and personal responsibility to be overcome by the ancient and discarded idea of corporate action and corporate responsibility.

With the various stages in the development of the knights of labor we are already fairly familiar, but Mr. Wright puts the facts again before us in a very clear and connected way. We learn how the personal character and history of Uriah S. Stephens, the founder of the order, impressed themselves upon its early organization, and how the order struggled along from its inception in

Philadelphia on Thanksgiving day, 1869, until the general assembly at Detroit in 1881 freed it from many of the restrictions placed upon it by Mr. Stephens, and made it so popular with certain sections of the people that since that time its growth has been phenomenal in the history of labor organizations. Mr. Stephens's controlling ideas seem to have been two, — first, that surplus labor always keeps wages down (it does not seem to have occurred to him that improving the quality of labor will cause wages to rise); and, second, that nothing can remedy this evil but a purely and deeply secret organization, based upon a plan that shall teach, or rather inculcate, organization, and at the same time educate its membership to one set of ideas ultimately subversive of the present wages system. The history of the knights of labor themselves, and the action of the general assembly at Detroit, are sufficient comments on this second principle. The order grew slowly at first, and, as time passed, the district, and finally the general assembly, were evolved to perfect and unify the organization of the local assembly. The first district assembly was organized in 1873, and the first general assembly met on New Year's day, 1878, at Reading. Mr. Wright notices the various general assembly meetings at Reading, St. Louis, Chicago, Pittsburg, Detroit, New York, Cincinnati, Philadelphia, Hamilton, Cleveland (a special meeting), and Richmond, and characterizes briefly the action taken at each. As to the strength of the order, he cites Mr. Powderly's testimony before the congressional committee in May, 1886, that it then numbered 500,000 members. At the time of the Richmond meeting last October, there were one hundred and sixty district assemblies and about nine thousand local assemblies. The total membership was then about 730,000. Mr. Wright believes that it is to-day about one million.

Mr. Wright mixes very little criticism or comment with his recital of facts, and we trust it is only because he wishes to avoid any appearance of discourtesy to those who have materially assisted him in collating his data. For, as to the attitude of sound and enlightened public opinion towards the knights of labor, there can be but one opinion. That there was a wide-spread sympathy with the organization and its aims at one time cannot be denied; and it is just as incontestable that this sympathy has been turned into disappointment and disgust by the excesses of the various organizations, and the abuse they have made of their power. Without this sympathy and the support of public opinion, no great movement, labor or other, can be carried to a successful consummation. The spectacle of half a million or even a million men arrogating to themselves the title and privileges of laborers to the exclusion of the other sixteen or seventeen millions of wage-earners in the country, is ludicrous enough; but it becomes supremely so when this small minority endeavors to prevent any of the majority from obtaining such employment as the latter may desire, at such wages as they are willing to accept. It is this general principle, quite as much as the various excesses that have been committed, that has disgusted thoughtful men with the whole movement. The cowardice of political leaders, and the miscalled philanthropy of various members of the community, have permitted things which, without them, no organization would have thought of undertaking, much less of prosecuting successfully.

THERE IS NO SUBJECT which has for the sanitarian more interest than that connected with the great mortality among the young children of our large cities. And as the principal factor in this mortality is represented by the term 'summer diarrhoea,' it is to diseases of this nature that especial attention is devoted by those who have at heart the welfare of the young. Thirty-five hundred persons succumbed to this class of diseases during the past year in New York City alone, more than half of the number in the two months of July and August. To diminish this mortality is a task worthy of the best efforts of the philanthropist; and every contribution to this end, however insignificant, should be gladly welcomed, and made, so far as it can be, the basis for action. Dr. L. Emmett Holt of New York, in a paper recently read before the New York academy of medicine, has made a very valuable addition to our knowledge of the causes at work in the production of summer diarrhoea, and to the methods for its treatment. After a full discussion of these points, he presents the following conclusions: 1. Summer diarrhoea is not to be regarded as a disease depending upon a single morbific agent; 2. The remote causes are many, and include heat, mode of feeding, surroundings, dentition, and many other factors; 3. The immediate cause is

the putrefactive changes which take place in the stomach and bowels in food not digested, which changes are often begun outside the body; 4. These products may act as systemic poisons, or the particles may cause local irritation and inflammation of the intestine. In the treatment of the affection, Dr. Holt believes that antiseptics are of great value, especially naphthalin and the salts of salicylic acid.

THERE SEEMS TO BE a disposition, on the part of congress, to transfer the signal service bureau to the new department of agriculture and labor. General Sheridan approves this plan, and says, that, as a school of instruction, the bureau is not needed in the army, and would prove rather an encumbrance than an advantage: while, so far as its meteorological observations are concerned, these relate wholly to the interests of agriculture and commerce, and should be under the direction of some civil branch officer of the government.

PROF. WILLIAM JAMES of Harvard has a very clear description of the laws of habit, in the current issue of the *Popular science monthly*, that is at once scientific and philosophical. The old-fashioned literary treatment of habits is as far removed as possible from the point of view and method of Professor James. He shows us that 'habit' is a term of very wide application, and that the phenomena of habit in living beings are due to the plasticity — which means the possession of a structure weak enough to yield to an influence, but strong enough not to yield all at once — of the organic materials of which their bodies are composed. Thus a full account of habits implies some reference to physics as well as to physiology and psychology. Tracing briefly, then, the physiological and psychological side of habits, Professor James passes to the ethical and pedagogical considerations which concern them. He calls habit the 'fly-wheel of society, its most precious conservative agent,' and claims that "it is well for the world that in most of us, by the age of thirty, the character has set like plaster, and will never soften again."

The decade between twenty and thirty is found to be the critical one in the formation of intellectual and professional habits, while the period of life before twenty is the most important for the fixing of personal habits. From this it follows easily that by education we must seek "to make automatic and habitual, as early as possible, as many useful actions as we can," and, conversely, to prevent the dropping into injurious habits. Professor James shows how unconsciously habits of mind are formed through the process of our daily routine, until some day we awake to the fact that we have acquired peculiar power or skill in some direction. The constant preaching of this truth would infuse new hope and ambition into many desponding workers.

THE EXCITEMENT AND ALARM which prevailed in this country last year and the previous one, in anticipation of cholera, have entirely subsided, and yet perhaps the danger of its appearance is as great to-day as it has been at any time in the past three years. Although frequent reference to its presence in Europe has been made in the daily press, its ravages have not been described as fully as the facts warrant. At Budapest there have been 1,329 cases with 586 deaths; at Fiume, 260 cases and 161 deaths; at Trieste, 896 cases and 557 deaths. In Japan during 1886 there were 153,930 cases, of which 100,492 were fatal. In Yokohama alone the cases numbered 3,021, and the deaths 2,273. In South America, cholera still exists at Montevideo and Mendoza; the U.S. consul, under date of Jan. 19, reporting that it has been officially declared at the former place. The disease still exists at Buenos Ayres, though it is said to be diminishing and of a less virulent form than heretofore. The presence of cholera on the west coast of South America, which has been announced by the press, still lacks official confirmation.

YOUTHFULNESS IN SCIENCE.

EVERY college instructor knows only too well how the more active-minded students are eager to grapple with the mightiest subjects, all in the untested pride of developing intelligence. Their themes are, 'The progress of democracy,' 'The comparison of French and English literature,' 'Solar energy,' 'The Darwinian theory,' 'The origin of mind;' in short, all the vastest problems, such as a lifetime is inadequate for. Most of us can gather from our personal recollections some examples of the foible. Youth does not know its measure. Only maturity, and not always even maturity, realizes how tiny and feeble is the force of the individual when it turns to attack the world problems, which stand more mysteriously