SCIENCE.

FRIDAY, FEBRUARY 26, 1886.

COMMENT AND CRITICISM.

PROFESSOR FREDERICQ of the University of Ghent, who has previously published essays on the modes of teaching history in Germany and in France, has recently issued a pamphlet on the study of history at the English and Scotch universities. At the latter he finds that little or no university instruction in history is given, but passes much favorable criticism on the methods in the historical schools of Oxford and Cambridge. Professor Fredericq makes one remark that we may well take home to ourselves; and that is, that the English universities provide no adequate education in what the Germans call 'Quellenstudie.' Anyone who has seen an historical seminar at a German university knows what an important part of historical instruction is made up by the study of chronology, paleography, and documents: in fact, the study of authorities forms the basis of all historical teaching in Germany. Edward A. Freeman, in his inaugural lecture, on 'The office of the historical professor,' delivered at Oxford in the autumn of 1884, touched upon this point, and announced his intention of giving much attention to the study of authorities. It is well known that Professor Seeley of Cambridge, and Prof. S. R. Gardiner also, have not failed of their duty in this particular; but with them we fear that the list ends. And in America we have until lately almost entirely overlooked this essential in historical knowledge. But the Johns Hopkins university, and, in a less degree, Columbia college, are pursuing the right method; and at both the historical student is taught to estimate and handle original materials, not merely stuffed with facts and dates at second-hand. It is only in this way that the student can ever obtain any thing more than a superficial knowledge of his subject, and come thoroughly in contact with the times he is investigating. It is not too much to say that the study of history without historical method is empty, and historical method is the greatest part of the study of history. If Professor Fredericq ever includes America in his investigations, we fear that the list of historical teachers who appreciate the value of 'Quellenstudie' will be even smaller than in England.

MR. BRADFORD LESLIE, in a paper read before the British institution of civil engineers, 'On an improved method of lighting vessels under way at night,' attempts to solve the difficult problem of enabling ships which are rapidly approaching at night, to determine their respective courses in time to manoeuvre with safety. To secure this result, many arrangements of lights have been proposed, but none, we believe, exactly like that suggested by Mr. Leslie. His plan, in general, is for a steamer to carry three white lights forward (two for a sailing-vessel), — one at the masthead, one on the forestay, and one on the stem; the three in line, and making an angle of 45° with the horizon. These would be plainly visible for eight or nine miles through a forward arc of 220°, or from two points abaft the beam on each side. It is evident that the course of the ship, under favorable circumstances, could be known always by observing the divergence between the line of the lights and the vertical. This angle decreases from 45°, for a course at right angles to the observer, to 0° when the ship is approaching head on. The latter, and those which approximate to it, are obviously the most critical courses, for which this system is especially valuable. The apparent angle of the line of lights with the vertical coincides nearly enough, for all practical purposes, up to 20°, or about two points, with the angle between the course of the approaching ship and the line of vision. This fact is of great value when there is no time to determine angles, either by plotting or calculation. It is not proposed to abandon the use of the colored side-lights, although, if the arrangement were entirely satisfactory in practice, they would be no longer necessary. The most serious obstacle to the success of this plan is the rolling and heeling motion of the ship, to which Mr. Leslie refers, but which, we believe, he underestimates. The principle involved in his suggestion is not new. It has been already proposed to arrange the masthead and side-lights to form an equilateral triangle in a plane parallel to the midship section, and also to place the masthead light so far aft that the line through it and either

of the side-lights should make an angle of 45° with the horizon. The system which has received the most attention, however, is known as that of the double side-lights. Various arrangements of these have been proposed, but all include the use of two lights on each side, in different positions with respect to each other, and at different distances apart. The subject of lighting ships, and also that of 'the rules of the road,' should be referred to an international commission, whose recommendations should be accepted and rigidly enforced by all maritime nations.

THE STUDY OF THE POLITICAL SCIENCES has made great progress of late in this country. Columbia, Cornell, and the University of Michigan, have established special schools of political science, all of which are successful; special attention is paid to these subjects at Harvard and Johns Hopkins; and the historical, economic, and social science associations, which have sprung up during the last decade, with their published proceedings, have all contributed to stimulate an interest in the scientific treatment of history, law, and economics. The latest advance in this field is the establishment of the *Political science quarterly*, edited by the faculty of political science of Columbia college, and published by Ginn & Co. The first number of this new quarterly will appear in March, and it will furnish a field for the discussion of all questions — historic, economic, or legal — which concern the organization of the state, the evolution of law, the relation of states one to another, and the relation of government to the individual. The quarterly will demand no political or economic orthodoxy, but will admit all articles within its scope which are at once scientific and of general interest. A feature of the publication will be its bibliography, which will be very complete and elaborate. The great success of the Johns Hopkins series of studies in historical and political science has doubtless led the Columbia professors to the establishment of this journal; and there is every prospect that it, too, will meet with favor. The whole development of which the above are the indications is a healthy and vigorous one. It betokens the introduction and application of scientific tests and methods in a domain which has in the past been too fruitful of partisan strife and dissensions.

IN 1880 A SITE was purchased for a new naval observatory a short distance beyond Georgetown, in the District of Columbia; but no appropriation has yet been made for erecting the necessary buildings, and removing the instruments from the present location. On account of this delay the secretary of the navy, in April, 1885, called upon the National academy of sciences for an expression of opinion as to the advisability of proceeding promptly with the erection of a new naval observatory; and the reply of the committee of the academy is contained at length in a letter from the secretary of the navy, just published as Executive document No. 67. The conclusions of the committee we give in the language of the report. This report is signed by F. A. P. Barnard, A. Graham Bell, J. D. Dana, S. P. Langley, Theodore Lyman, E. C. Pickering, C. A. Young. 1. It is advisable to proceed promptly with the erection of a new observatory upon the site purchased in 1880 for this purpose. 2. It is advisable that the observatory so erected shall be, and shall be styled, as the present observatory was styled originally, the 'National observatory of the United States,' and that it shall be under civilian administration. 3. It is advisable that the instruments in the present observatory, with the exception of the 26-inch telescope, the transit circles, and the prime vertical transit, shall be transferred to the observatory at Annapolis, with such members of the astronomical staff as may be required to operate them; also that such books of the library as relate chiefly to navigation shall take the same destination; the instruments above particularly specified, with the remainder of the library, being reserved as part of the equipment of the new national observatory, to which also the remaining officers of the astronomical staff shall be assigned for duty. 4. It is advisable that the observatory at Annapolis shall be enlarged, if necessary, and adapted to subserve as effectually as possible the wants of the naval service, whether practical, scientific, or educational; that it shall be under the direction of the department of the navy, and shall be styled the 'Naval observatory of the United States.' The grounds upon which this decision is based are set forth in the document to which we have referred; and numerous letters are appended, from astronomers and others, in regard to the administration of the observatory, and from physicians of Washington, upon the healthfulness of the portion of the city in which the observatory is at present situated. It will be seen immediately that this report is intended to favor the establishment of an observatory worthy

of the country, and the placing its control in the hands of those who have made astronomy their life-work. The navy will be provided, if the recommendations are carried out, with an observatory well suited to its special needs, and would be relieved from the task of supervising work in which it has no interest aside from that felt in scientific work in general.

CRATER LAKE, OREGON, A PROPOSED NATIONAL RESERVATION.

IN the heart of the Cascade Range there is a little sheet of water which is destined to take high rank among the wonders of the world. It is a unique phenomenon, taken as a whole, though some of its component features, taken singly, may not be unexampled. The lake is about seven and one-half miles long and five miles wide. Its shape is very nearly elliptical, without bays or promontories. It is girt about by a complete circuit of cliffs, nowhere affording an outlet. These cliffs rise to altitudes varying from 900 to 2,200 feet above the water, and, though generally too steep to be either ascended or descended, have in some places an inclination low enough to render such a feat possible, though difficult. They plunge at once into deep water, and never afford a wide margin for standing or walking room at the water's edge. In a few places, however, the rains have scoured gulleys in the wall; and, where these debouch upon the lake surface, may be found narrow spaces for lodgement. No considerable stream or brook has been discovered flowing into the lake as yet; but a few springs yield little rills of water in the faces of the walls. Others and larger ones may come to light when the lake is more minutely explored. Neither is there any visible outlet. It is certain, however, that there must be a mode of escape for the water; and, as it is not above ground, it must needs be below ground, for the evaporation here is less than the precipitation.

Near the south-western margin, about half a mile from the shore, there rises out of the water a cinder-cone. Its height is between 600 and 700 feet. It is quite perfect and typical in form, having the usual cup or hopper in its summit, and as yet it is not perceptibly eroded. It is well covered with timber, and, notwithstanding its perfect preservation, it cannot be regarded as being, in the historic sense, a recent creation. From its base two streams of lava stretch out towards the great wall, but do not reach it. The insulation of the cone and its lavas is still complete.

The beauty and majesty of the scene are indescribable. As the visitor reaches the brink of the cliff, he suddenly sees below him an expanse of ultramarine blue of a richness and intensity which he has probably never seen before, and will not be likely to see again. Lake Tahoe may rival this color, but cannot surpass it. It is deeper and richer than the blue of the sky above on the clearest day. Just at the margin of the lake it shades into a turquoise, which is, if possible, more beautiful still. Ordinarily the water surface is mirror-like, and reflects an inverted image of the surrounding cliffs in detail. Very majestic, too, are the great environing walls. On the west side they reach their greatest altitude, rising almost vertically more than 2,000 feet above the water. It is difficult to compare this scene with any other in the world, for there is none that sufficiently resembles it; but, in a general way, it may be said that it is of the same order of impressiveness and beauty as the Yosemite valley. It was touching to see the worthy but untutored people, who had ridden a hundred miles in freight-wagons to behold it, vainly striving to keep back tears as they poured forth their exclamations of wonder and joy akin to pain. Nor was it less so to see so cultivated and learned a man as my companion hardly able to command himself to speak with his customary calmness.

To the geologist this remarkable feature is not less impressive than it is to the lover of the beautiful; for, almost at the first glance, it reveals something which would probably escape the eye of the mere tourist. This broad depression was once filled and occupied by a large volcanic cone, rising far above the loftiest point of its encircling walls.

The proof is simple and conclusive. Whoever has studied a large volcanic cone, composed of lavas piled sheet upon sheet around a central orifice, and which has been subject to long-continued erosion, will be able to recall some general facts as to the ravines and water-courses which have been scoured in its flanks. As we approach such a mountain, we observe the ravines opening upon the plain, or gentle slope, around its base, with huge buttresses between them, sometimes rounded and broad, sometimes narrow and knife-edged, according as the spaces between ravines are great or small. As we ascend the bed of any one of them, we observe that it grows deeper and deeper, while the intervening buttresses rise higher and higher, until a maximum depth is reached. Farther up, the declivity of the bed becomes greater, lateral streams come in, the ravine branches repeatedly, and up near the summit it resolves itself into a plexus of small rills, all embraced in an amphitheatre,