SCIENCE.

FRIDAY, MARCH 5, 1886.

COMMENT AND CRITICISM.

IT SEEMS PROBABLE that in the latter part of April, and first part of May, we are to have the unusual spectacle of two fine comets visible at the same time. We have already mentioned the increasing brightness of Barnard's comet, and we now learn, from Dr. Oppenheim's study of the comet discovered by Fabry at the Paris observatory on Dec. 1, that this comet will greatly surpass Barnard's in brilliancy. It will be seen in the north, and its position will be very similar to that of the brilliant comet of 1881. For a short time it will not set at all in our latitude, but will remain visible throughout the night. The comet is now visible in a moderate-sized telescope, and is increasing slowly in brightness. About April 1 the increase will become more rapid, and by the middle or latter part of that month it will undoubtedly become visible to the naked eye. Its maximum brightness, over six hundred times as bright as when it was discovered, will be reached about the first of May, when it will be situated in the sky, not far from Barnard's comet; and by the end of May it will have passed south of the equator, becoming again a telescopic object. Another favorable circumstance is noted in the fact, that, when the comet is at its brightest, there will be no moon to detract from its splendor. Dr. Weiss points out the possibility that on the 26th or 27th of April the comet may be between us and the sun, and may consequently be projected on the sun's disk.

THE ANNUAL REPORT of the managers and superintendent of the reformatory at Elmira to the New York legislature is not a very large document, but every page of it is of the greatest interest. It is the record of the progress of an attempt, not merely to confine and punish criminals, but to reform them, and to make good and useful citizens out of a class of men usually given over altogether by society as dangerous. It will be remembered that this institution was founded in 1870; and it was then enacted, that, at the discretion of the court, any male criminal between the ages of sixteen and thirty, who had not previously been sentenced to a state prison in this or any other country, might be sent to it; and by the provisions of the act the managers were made a reforming and not a merely punishing body. No criminal was to be confined for a longer period than the legal term of the sentence for the crime of which he was convicted; but he might be released at any time after six months' confinement, if, in the judgment of the managers of the institution, he was sufficiently reformed to be trusted with his freedom. How well Mr. Z. R. Brockway, the superintendent, has succeeded in his task of reformation, is well known to students of our penal institutions, and the many problems connected with them. But we believe that the general public will hardly be prepared to hear the facts and figures adduced in the present report.

Mr. Brockway believes that the common incentives to crime are ignorance, improvidence, and indigence; and he undertakes to employ the time during which the prisoners are confined, in endeavoring to remove and guard against these incentives. To ignorance he opposes education; to improvidence and indigence, voluntary earning and saving; and he calls these "indispensable elements in any rational, effective, reformative system of prison management." The details of the scheme of instruction, as given in this report, are marvellous, especially those concerning the English literature class, which is a new feature, and one called into being in order to fill in the gap between the hours of compulsory labor and compulsory study, — a period "in which inmates returning to their accustomed thoughts often return, at the same time, to their former selves; so that much labor was lost, and injury derived." Imagine five hundred felons intently poring over 'Hamlet,' the 'Canterbury tales,' 'Rasselas,' Bacon's 'Essays,' Browning's 'Rabbi ben Ezra,' — names selected at random from a long list of works studied! This sounds very fanciful; but, as a matter of fact, the results are very practical. The reformatory keeps accurate statistics regarding its inmates; and, of the 2,061 prisoners handled under the act of 1877, the state has protection against 1,878, or 91.1 per cent; and it is

unprotected against only 183, or 8.9 per cent. Of the former number, 658 are still in custody at the reformatory, 109 were released and sent out of the state, 11 were absolutely released as satisfactory without any parole, and 735 were released after parole.

Mr. Brockway, in another set of tables, estimates that 81.2 per cent of the whole number paroled are reformed, and that only 16.3 per cent returned to criminal practices or contact. This is a wonderful showing, and betokens a departure in prison theory and practice that should before long become general. Under this system the state does not lock its offenders up for a certain time, and then take its chances with them; but it employs the months of confinement in guarding itself against the future. On the consequent advantages to the criminal and to society, not a word need be wasted. An interesting and valuable appendix to the present report is a series of charts, prepared by Mr. Brockway, to show graphically the fluctuations in the course and progress toward release, of one thousand prisoners under the reformatory system. They show some curious cases of what may be called 'reversals to type,' and are valuable as psychological and ethical studies. The average population of the institution in 1885 was 647; the average period of detention of the present inmates was 16.9 months; and the average detention before parole, and of the whole number paroled to date, was 20.7 months.

THE COMMITTEE of the national academy, to which was referred the question of a new naval observatory, as mentioned in our last week's issue, was called upon by the secretary of the navy for an opinion on two other questions of considerable interest to astronomers: viz., the expediency of making the change in the beginning of the astronomical day from midnight to noon, as recommended by the meridian conference; and as to the advisability of asking congress to make an appropriation for the observation of the total solar eclipse of Aug. 28-29. In regard to the astronomical day, the committee recommends that the change should be made as soon as sufficient concert of action can be secured among the leading astronomers and astronomical establishments of the civilized world, —'in 1890 if possible; if not, in 1900.' This conclusion is reached, in view of the general consensus of the astronomers of this country in favor of the change, and the adhesion to the same view of so important an institution as the Royal observatory of England.

In regard to the observation of the eclipse, the committee is not in favor of calling upon congress for an appropriation, on the ground, mainly, that there would not probably be sufficient time to make such preparation of instruments and observers as to insure results commensurate with the magnitude of the undertaking. The report says, "In addition to the observation of the sun itself, and the luminous phenomena attending it, it is desirable to obtain photographic maps of all the surrounding region, to the distance of at least ten or fifteen degrees from the sun, for the purpose of finally setting at rest the still mooted question of an intra-mercurial planet. It is true that the astronomical world is at present disposed generally to discredit the existence of such a body; yet the evidence on the subject, up to this time, is mainly negative, as it must always continue to be, so long as it depends upon direct vision. In a photographic map taken during total eclipse of the sun, of the whole region within which such a planet must necessarily be confined, the object, if present, must present itself, and could not fail to be recognized."

RAILWAY COMPANIES have become so important a part of our industrial organization, and the power they wield is so great, that the right adjustment of their relations to individuals and to the public at large is imperatively necessary. Troubles are constantly arising between the companies themselves, between the companies and shippers, and between the companies and their employees, leading oftentimes to a great disturbance of the national industry. A railroad 'war' is raging at this very moment among the transcontinental lines at the west; and it is only a short time since a dispute between corporations and their workmen almost paralyzed the business of Galveston. How such disputes can best be settled, — whether by state regulation, by arbitration, or by leaving the evil to work its own cure, — is the question before us deserving notice. We would call attention to a certain distinction which prevails in the matter, and which is liable to be insufficiently attended to. The state may interfere with the making and execution of contracts for either of two purposes, — for the sake of the contracting parties or of one of them, or

for the sake of third parties or of the general public. A contract between two parties may have an important effect on the rights and interests of persons who are noway concerned with the making of it, and in such cases it has long been the custom for the state to interfere for the protection of those persons. Such cases often arise in relation to common carriers. For instance: if a railway company charges one shipper a higher price for carrying freight than it charges another for the very same service, it does injustice to the party against whom the discrimination is made; hence recent decisions of the federal courts have declared such discrimination to be unlawful.

THE MEETING of the American economic association, held on Saturday last in this city, indicated that the interests of the association are being wisely provided for, and that the plans under preparation are in the interest of true science. It showed itself cautious, and gave no countenance to the establishment of a newer creed with fresh dogmatic utterances. In the deliberations the prominent fact stood out that the purpose of the society must be in method. Scientific method of investigation is the great need of economics at the present time, and it is to this department of work that this new association can unfalteringly commit itself. The patient collection and analysis of facts is a necessity which requires no apology in these days of confusing arguments drawn from insufficient statistical and social data. The council, however, assembled for practical work, and took a step forward in the development of the usefulness of the society by admitting the Connecticut valley economic association into its membership. This force, of about seventy-five members, is located chiefly at Springfield, Mass., and is a local society recently founded, and modelled after the constitution of the larger association. It was also determined to publish at an early date one or two monographs, as well as the secretary's report, which will shortly be in print.

GEOGRAPHY-TEACHING IN GERMANY.

IN the matter of geographical education, Germany may be taken as the model which other European countries are following, so far as their special circumstances will permit. It is true that teachers like Dr. Lehman and Professor Wagner are not satisfied with the position yet attained in German schools. But to the eyes of Mr. Keltie, accustomed as they were to the methods and appliances of English schools, Germany seemed very far ahead. He therefore devoted a considerable portion of his 'report,' recently published by the Royal geographical society, to a description of what we may call the German system of geographical education. According to him, the ideal aimed at, and indeed being rapidly carried out, is to have one continuous course of geographical instruction from the first year in the primary school up to the university.

The preliminary stage, or what is known in Germany as *heimatskunde*, combined with or preceded by actual observation, is met with in nearly all the primary schools and in the preparatory classes of the higher schools. There are no textbooks in this early stage, except for the teacher, the pupil obtaining his ideas from actual observation or practice. The instruction begins with the student's home surroundings, and proceeds outwards from the town to the district, then to the province, Germany, Europe, and, finally, the world in general. At the outset the pupils are given a mastery of the cardinal points, the course of the sun in the heavens, and similar elementary notions. This is done, not by compelling him to commit the compass-card to memory, but by getting him to find the direction of his own house from the schoolroom, and by encouraging him to apply a few simple ideas in his daily walks and games. The next step is to teach him how to read a map. Here, again, his local knowledge is utilized. A map of his own town is procured, and he learns how to trace his own homeward path, and to find out the direction of some well-known buildings. Then he often visits, map in hand, the surrounding country, and thus learns the actual meaning of this or that geographical symbol. Often these excursions are extended to distant points of interest. Many teachers think that students acquire this faculty of map-reading best by learning how to use the geographical symbols themselves, or, in other words, by practice in map-drawing; but, wherever this method is followed, it is insisted on that the drawing is done, not to produce a work of art, but solely to familiarize the pupil with contour lines, mountain-shading, and other similar signs. In some schools the pupils build up the relief of a country with sand; in others the contour lines are reproduced in card-board, and the relief is built up with great exactness. When the maps are well made, as most modern German maps are, no better way to teach the meaning of geographical symbols could be devised. But the conditions must be favorable; and, above all, maps with unusual symbols, such

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