

SCIENCE.

FRIDAY, JUNE 4, 1886.

COMMENT AND CRITICISM.

IN A RECENT NUMBER of the *Revue internationale de l'enseignement*, M. Breal, who has written before on educational topics, has an essay on the methods of acquiring foreign languages. Among some old considerations of value, he adds the less well-known remark, that, when a person goes to a foreign country to 'learn the language,' he rarely succeeds. But if he goes to pursue some definite profession or business, — M. Breal suggests banking at Frankfort, the book-trade at Leipzig, and brewing at Munich, among others, — then he acquires the language very rapidly as well as very thoroughly. The reason for this is plain enough: it is the substitution of natural for scholastic methods. And nature, being the better teacher, comes out ahead. In the former case, dictionaries and grammars figure largely; while, in following M. Breal's suggestions, the phrases of ordinary conversation, as well as the terminology of some particular calling, become part of the student's daily experience from the first. The hint is a valuable one, and it might save time and money, to say nothing of a discouraged spirit, to the numerous young men and women who go to Germany, France, and Italy each year to 'learn the language.'

IN THE DEATH, on May 16, of the aged German historian, the world has lost a scholar who has done as much as, if not more than, any one else for the extension of scientific method, and for the application to history of those rules and tests which mark the nineteenth century as pre-eminently the era of science. Born in 1795, when the reign of terror was hardly passed, and when the metaphysical notions as to the theory of the state and the rights of man which had been formulated by Bodin, Grotius, Montèsquieu, Voltaire, and Rousseau, were finding their logical outcome in anarchy, Ranke grew up in a period of transition. The wave of constitutionalism was gathering a force to which even the reaction from the revolutionary excesses of the commune, aided by the holy alliance, could be but a temporary check.

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With a genius that detected the chain of causation amid a complicated mass of detail, with an exactness and an accuracy that made even the smallest event of importance, and with a power of lucid, graphic statement which attracted and interested while it instructed, Ranke was born a scientific historian. He appreciated to the full the meaning of the contemporary development, but with true historical instinct he turned to the elucidation of that previous period of transition from feudalism to absolutism which is the key to the history of western Europe in the fifteenth, sixteenth, and seventeenth centuries. In this field he was the acknowledged master. In addition to his own magnificent labors, we owe to Von Ranke the *seminarium*, that peculiarly scientific department of university work. And it is from him that Waitz, Giesebrecht, Von Sybel, George Bancroft, and a host of lesser historians have drawn their inspirations.

FABRY'S AND BARNARD'S COMETS, the two that have been with us since last December, have now disappeared from view in the northern hemisphere. Very few astronomers appear to have seen these comets under the most favorable circumstances. Mr. T. W. Backhouse, however, reports that on April 26 he followed the tail of Fabry's comet to a distance of thirty-eight degrees; and Barnard's comet he found on May 1 had two tails, the principal one four and a half degrees in length. To replace these comets we have three new ones discovered by Mr. Brooks, on April 27 and 30, and May 22, respectively. They are all fairly bright for what are called 'telescopic' comets. The calculated elements show that the first reaches its nearest point to the sun on June 6, and is increasing slightly in brightness: the second comet is decreasing in brightness, having passed its perihelion on May 4.

HEALTH OF NEW YORK DURING APRIL.

THE total population of New York on April 1 was estimated at 1,428,898, and is believed to be increasing at the weekly rate of 799.

The total number of deaths from all causes was 2,965, or about 99 each day. Comparing this with

the same number of days in March, there was a reduction representing the saving of 290 lives, and this not taking into account an increase in the population of more than 3,000 souls.

In March the largest number of persons succumbed to disease on the 31st, there being on that day 137 deaths recorded; on the 30th of April the maximum limit was reached, amounting to but 124 deaths.

The deaths of children under five years of age during March were 1,221, and in April but 1,075; and yet diarrhoeal diseases carried off in April 56 persons, and only 32 in the preceding month. Scarlet-fever caused a mortality of 49 this month, as compared with 42 in March. The lines in the chart representing scarlet-fever and the diarrhoeal diseases, which for two months have nearly coincided, now begin to diverge, and the separation will be more and more marked as the season advances. The increase of deaths from diarrhoeal diseases appears to be pretty evenly distributed throughout the month, and not very perceptibly increased in any one period over another. The largest number of deaths from diseases of this nature in any one day was 5, on the 22d. The week in which this occurred was characterized by high temperatures, 81°, 74°, 74°, 81°, 84°, and 88° being the maxima for six consecutive days beginning with the 19th; and during this period there were 16 deaths from this class. The next largest number of deaths was 4, on the 11th inst.; and on six consecutive days of that week the maxima reached by the thermometer were respectively 70°, 52°, 64°, 68°, 69°, and 67°, and the recorded deaths were 14.

This is an interesting comparison, and would seem to show that there are other influences at work in the causation of diarrhoeal diseases than an elevation of temperature at one part of the day. On these days, when the thermometer was ranging from 74° to 84° in the afternoon, it was at other parts of the day much lower, sometimes as low as 48°. It is the high temperature continued throughout the greater part of the twenty-four hours, and repeated day after day, as occurs in July and August, which produces such fearful ravages among the inhabitants of the large cities. Especially is this destructive influence marked when the air is laden with moisture. A study of the accompanying chart will show, that, at the time when these high temperatures occurred, the air was comparatively dry; on the 23d inst., when the maximum temperature was 84°, the humidity was but 60, saturation being 100. That this is an important element in the problem is not to be overlooked. It is a matter of common experience that a temperature of 90° with a dry atmosphere

can be more comfortably borne than one of 80° with the air saturated with moisture. In the one case evaporation from the body is rapid, resulting in a cooling of the surface; in the other it is impeded, or seriously interfered with.

Consumption and diphtheria show for April, as compared with March, a slight decrease in mortality.

The mean temperature for the month was 52.87°, that for March having been 37.60°. The maximum was on the twenty-third day, the thermometer then registering 84°. This is the highest recorded in the month of April since 1871. 62° was the highest point reached by the mercury during March: its lowest point in that month was 8°, while during April at no time was it more than two degrees below freezing.

While the number of days upon which rain fell was but seven, rather less than the average for a considerable number of years, yet the total amount of water which fell was 3.85 inches, considerably above the average amount for the same period. On the 4th of the month one-quarter of an inch of snow fell, and three-quarters of an inch on the day following. In the corresponding month of 1885, there were several flurries of snow, the amount being too small to accurately measure. Snow is not a frequent visitor in the month of April: in the year 1870 it fell to the depth of two inches and a half; in 1875 no less than thirteen inches and a half are recorded; and in the years 1882 and 1883 there was in each one half-inch. With these exceptions, no snow has fallen in April during the past fifteen years. From a meteorological point of view, April, 1886, was an exceptional month.

SYMPATHETIC VIBRATIONS OF JETS.¹

AFTER a brief historical notice of the observations of Savart, Masson, Sondhauss, Kundt, Lacoste, Barret and Tyndall, Decharme, and Neyreneuf, on the sympathetic vibrations of jets and flames, the author described his own experiments. Attention was directed to the subject by the accidental observation that a pulsating air-jet directed against a flame caused the latter to emit a musical sound. The pitch of this sound depended solely on the rapidity of the jet-pulsations, but its intensity was found to increase in a remarkable way with the distance of the flame from the orifice. In order to study the phenomenon, air was allowed to escape against the flame from a small orifice in the diaphragm of an ordinary telephone, the chamber behind the diaphragm

¹ Abstract of paper read before the Royal society, April 28, by Chichester A. Bell.