SCIENCE.

FRIDAY, MAY 22, 1885.

COMMENT AND CRITICISM.

As we look back at the literature of modern physiology, — a retrospect suggested by the recent appearance of an index to Pflüger's *Archiv für physiologie*, — two facts especially impress us: first, that the bulk of the researches comes from Germany; secondly, that modern experimental science is scarce over forty years old, but has developed in extraordinary crescendo. There is, perhaps, no other science so pre-eminently German, and to which other nations have contributed relatively so little. In Germany the first physiological laboratories were founded, and these have become important 'institutes,' which are the patterns other countries are now slowly imitating. In Germany the science first became strictly experimental, and its modern methods and aims were wrought out. The German universities have been the training-places of the majority of professional physiologists the world over, and these men have been the apostles of German influence.

Our indebtedness to modern physiology can hardly be over-estimated; for its acquisitions represent not only an invaluable intellectual evolution, but also knowledge of immeasurable utility in manifold practical aspects. It has changed medicine from a crude empirical art to an intelligent application of science, and has done more than any other cause to raise the mental status of the medical profession by inculcating the rational foundation of the practice of medicine. The chief initiatory impulse to modern physiology was given by the greatest of German biologists, Johannes Müller, — a man remarkable alike for his own intellectual achievements, and for the stimulus he imparted to others. He was one of the chief founders of the sciences of morphology, physiology, and comparative anatomy. His influence in physiology has been perpetuated by his distinguished pupils, notably the veterans, Ludwig, Helmholz, Brücke, and Du Bois Reymond, who are living to see two generations of followers. Thus the young physiologist of to-day might be called the great-grand-pupil of Johannes Müller.

The literature of physiology has grown with constantly expanding rapidity. At first the memoirs were scattered in numerous scientific and medical publications, but soon two periodicals acquired the lead as media for the announcement of physiological discoveries. Müller's own *Archiv* expressly included physiology in its scope, as did also the *Zeitschrift für rationelle medicin*, a journal of high scientific rank. It was long before there was any periodical exclusively devoted to physiology, Pflüger's *Archiv* not being founded until 1868. At first Pflüger's volumes were annual, but at present he issues nearly three volumes a year. Since then two other first-class physiological journals have been started in Germany. Hoppe-Seyler edits a new and successful *Zeitschrift für physiologische chemie;* and the continuation of Müller's *Archiv* has been divided, the physiological part now forming a separate annual volume. The annual report on the progress of physiology, giving abstracts only, alone makes a bulky volume, which shows, moreover, that nearly all the papers are in German. While the extraordinary development of physiology in Germany has been going on, what have other countries contributed? Very little. There are only two other physiological journals of any note, — one decidedly second-rate, in France; and another the outcome of the combined efforts of England and America, which, though excellent scientifically, is uncertain as to its viability. In short, the

world depends, now as formerly, mainly on Germany for the progress it makes in the knowledge of the functions of life.

"It is one of the melancholy things connected with publication in government reports," writes one connected with the government, "that your work appears so many years after it has been completed, that the author has in the mean time quite outgrown it, and developed into another stage of opinion and activity." This is not a matter of months only, but of years, and, though not so serious a difficulty as formerly, is still a great drawback to efficient and effective work. The administration of the public printing-office is such that every thing has to give way to congressional documents which are often of the smallest value. Is there no remedy for this uncomfortable state of things?

LETTERS TO THE EDITOR.

**** *Correspondents are requested to be as brief as possible. The writer's name is in all cases required as proof of good faith.*

Progress of vegetation in the Ohio valley.

The spring of the present year has been very late in the valley of the Ohio; so late, indeed, that nearly every one has said that it has not been so long coming for many years. A review, under these circumstances, of a record kept of the early-flowering plants for eight years, may be of interest. The first appearance of flowers is a more reliable indication of the state of the weather than the thermometer. Plants indicate the general average of climatic conditions; and the species, appearing in much the same sequence, indicate the progress of spring. In the table of fifteen species here presented, of the first flowers which generally appear, a number of facts are to be noted. It is to be noticed that every alternate year is a cold year, or one, at least, with a late spring. The years 1874, 1876, 1878, and 1884 are early ones, while 1875, 1877, 1883, and 1885 are late.

In 1874 eleven out of the fifteen plants were observed between March 19 and 26, a period of eight days; in 1876 nine out of the fifteen were seen between Feb. 12 and March 14, just a month; in 1878 the eleven of which there is record were found between March 3 and March 18, or sixteen days; while in 1884 the thirteen were recorded between March 16 and 30, or fifteen days. These were the early years. In 1875 fourteen out of the fifteen bloomed between March 30 and April 11, or in thirteen days; in 1877 two were out on March 4, none others until April 1, and between that and the 12th twelve came out; in 1883 two were out on March 4, one on March 13, and ten between April 6 and 12; lastly, in the present year the first flower did not appear until April 1, and thirteen others bloomed up to the 20th.

Account is here taken of only fifteen species. More than this number appeared during the time between the earliest and latest dates; but the ones here considered may be regarded as the *typical* early flowers. They represent eleven different orders.

The earliest year of the eight is 1876. In that year the spring cress (Cardamine rotundifolia) was in bloom Feb. 12, and the dandelion (Taraxacum dens-leonis), generally the earliest composite, on April 7. In 1875 the first flower, red elm (Ulmus fulva), was in bloom March 30, and the dandelion on April 29; while in the present year, in many respects the counterpart of it, the first flower, white maple (Acer dasycarpum), was out April 1, and the dandelion on the 26th. But even 1875, the latest of all, was, on an average, six days in advance of this year. This season is, then, nearly a week later than any in eight recorded years, and is seven weeks and two days behind the earliest year (1876) of the same eight.

In scanning the list, it is further found that three out of these fifteen early flowers are trees; nine of the remainder are provided with bulbs, tubers, or rhizomes, in which nourishment is stored up; one (Anemone acutiloba) has persistent evergreen leaves; and only the remaining two (Capsella and Taraxacum) seem to have no special fund upon which to draw. The importance, then, to herbs, of a store of matter

Species.	1874.	1875.	1876.	1877.	1878.	1883.	1884.	1885.
Acer dasycarpum	–	4-4	2-26	4-1	3-8	3-4	3-23	4-1
Symplocarpus foetidus	4-19*	4-6	2-13	3-4	3-3	3-4	3-18	4-5
Erigenia bulbosa	3-26	4-6	2-13	4-1	3-3	4-8	3-16	4-5
Anemone acutiloba	3-19	4-6	4-2*	4-1	3-8	4-6	3-23	4-12
Sanguinaria Canadensis	3-29	4-8	–	4-1	–	4-12	3-24	4-12
Ulmus Americana	3-22	4-4	2-27	4-1	3-8	4-6	3-16	4-6
Ulmus fulva	3-19	3-30	2-27	4-1	3-10	4-6	3-28	4-10
Cardamine rotundifolia	3-22	4-7	2-12	3-4	3-8	3-13	3-23	4-18
Erythronium albidum	3-26	4-8	3-14	4-12	3-18	4-12	3-23	4-18
Claytonia Virginica	3-22	4-6	2-13	4-1	3-8	4-8	3-24	4-18
Capsella bursa-pastoris	3-22	4-7	4-2*	4-2	3-10	4-13	3-30	4-19
Anemone thalictroides	3-22	4-7	3-12	4-1	3-10	4-6	3-27	4-19
Dentaria laciniata	4-6	4-11	4-2*	4-7	–	4-12	3-30	4-20
Jeffersonia diphylla	4-20	4-11	–	4-8	–	–	–	4-20
Taraxacum dens-leonis	4-19	4-29	4-7	4-15	–	–	–	4-26

* These were probably in bloom at an earlier date than this; but they are so recorded in my note-books, and were seen first on the dates given.