SCIENCE.

FRIDAY, OCTOBER 5, 1883.

NATIONAL TRAITS IN SCIENCE.

THERE are at present three principal currents of scientific work, — German, English, and French. The scientific writings of each nationality are characteristic, and, taken as a whole, offer in each case distinctive qualities. German influence is now predominant over the scientific world, as French influence was uppermost during the earlier part of this century; but the sway of Germany over western thought is far more potent and wide-spread than was ever that of France. As students once gathered in Paris, so they now flock to Germany; and thence back to their own lands they carry the notions of German science, and labor to extend, imitate, and rival them. Thus German ideas have been spread abroad, and established in foreign countries. This has set a common standard for scientific work, which is accepted in most European countries. German influence is evident by its effects in Switzerland, Russia, Italy, Poland, Belgium, England, and America, and in degrees indicated by the order given: in France, Spain, and Portugal, it is hardly noticeable. Holland and the Scandinavian countries have for many years achieved so much and so excellent work, that their scientific development may be said to have accompanied rather than to have followed that of Germany.

German science has unquestionably distinctive qualities. Its pursuit is a special and honored calling, attractive to the highest talent: its productions have the stamp of professional work. The German scientific man is first and principally an investigator: he is obliged to be so, otherwise he loses in the race. He wins his position in the hierarchy of learning by the original researches he carries out. To succeed under these circumstances, a man must discover something which is a real addition to knowledge; and to do this, he must be thoroughly familiar with all that has been previously accomplished in his field. Moreover, to advance beyond his peers, the investigator must utilize every possible extraneous advantage; more especially must he have a mastery over the methods to be employed, and be familiar with all novelties and refinements therein. It cannot be gainsaid that these requirements are more fully answered in Germany than anywhere else. It is certain, that, excepting of course a small minority, German scientific publications always contain something really new, and unknown before: each article is a scientific progress, which, however slight, still brings an actual increment to our store of information. Another result of this professional thoroughness is equally striking and characteristic. Being fully posted as to the status of his department, the German often displays a singularly just and keen appreciation of what problems are for the moment best worth studying, as being open for solution, and leading to something farther, or else filling a gap left. He is thus enabled to render his work efficient. It is sad to think how much scientific work is wasted because the labor is not wisely directed.

In German scientific writings the excellence of the matter usually contrasts vividly with the defective style and presentation. Indeed, the Germans, despite the superiority of their modern literature, are awkward writers, and too often slovenly in literary composition. Conciseness and clearness are good qualities, which may assuredly be attained by the expenditure of thought and pains; but these the German investigator seems unwilling, in many cases, to bestow upon his pen-work, but follows the easier plan of great diffuseness. Besides this, another defect is not uncommon, — the ill-considered arrangement of the matter. This occurs in all degrees, from a well-nigh incredible confusion, to be sometimes found even in elaborate and important essays, to a slightly

illogical order. In this regard, a curious and not infrequent variety of this fault deserves mention. According to the headings of the chapters or sections, the division of topics is perfect; but under each head the matters are tumbled together as if a clerk was contented to stuff his papers in anyhow, if only he crammed them into the right pigeon-hole.

Speaking broadly, the German mind lacks conspicuously the habits of clearness and order. There have been celebrated exceptions, but they were individual. The nation regards itself as having a decidedly philosophical bent, meaning a facility at taking broad and profound views of the known. We venture to contradict this opinion, doing it advisedly. Their profundity is mysticism, their breadth vagueness, yet a good philosopher must think clearly. It is a remarkable but little heeded fact, that Germany has not contributed her share to the generalizations of science: she has produced no Linné, Darwin, Lyell, Lavoisier, or Descartes, each of whom bequeathed to posterity a new realm of knowledge, although she has given to the world grand results by the accumulated achievements of her investigators. The German's imperfect sense of humor is another obstacle which besets him on every path. He is cut off from the perception of some absurdity, like that of Kant's neumenon, for instance. One cannot explain this to him: it were easier to explain a shadow to the sun, who always sees the lighted side. To state the whole epigrammatically, German science is the professional investigation of detail, slowly attaining generalizations.

English science is the opposite of this, — amateurish rather than professional. Some might call it insular, yet we should hardly join them in so doing. In fact, the professional investigator has hardly been a recognized character in the English social organization: until recently he was barely acknowledged, even by the universities, which sought instructors who knew and could teach, who might investigate and discover in a subsidiary, and, as it were, unofficial way. A large number of English scientific men were disconnected from the universities and colleges after their own student years, and were half or wholly amateurs; and their writings show the effects of this separation, not always, to be sure, but in many cases with painful evidence, by a lack of thoroughness, an imperfect acquaintance with other investigations, and a failure to grasp the essential part of the problem: in brief, such writings appear behindhand and superficial. Yet amid these poorer productions are to be found a right goodly number of the best scientific articles we possess in any language. Of late years the proportion of the good has steadily increased, and investigation is now more correctly appreciated than ever before. Indeed, there is no more encouraging event in the recent progress of science than the sudden elevation of the standard of original research in England. The English are trained writers: their scientific articles excel the German in literary merit, being seldom slovenly either in arrangement or style, and rarely wearisome from sheer diffuseness. Very noteworthy is the fertility in generalizations of the English: this is with them the outcome of individual endowments, a single master attaining a broad conclusion, — a process of individual effort quite unlike the German democratic method of generalizing by the accumulations of many. Is it too much to say that the English and Scotch are the Greeks of modern philosophy?

French science is decidedly provincial: it is apart, having only an imperfect, uncertain acquaintance with the great world outside, and its international interests of original research. The French have lagged far behind the great movements of recent years. Consider only how backward they have been in the comprehension and acceptance of the Darwinian theory; and remember, too, that it were wiser to take out the mainspring from a watch than to eliminate evolution from biology. French scientific articles are well written, the matter is admirably classified, it is all very clear. The keen, artistic sense of the nation displays itself here; but it also deludes them into presenting a rounded survey of a greater field than is demanded by

the actual discoveries they report. To satisfy this yearning for artistic completeness, elaborate and tedious disquisitions, and hackneyed principles, and facts long known, are interpolated; and even worse may be, when the imagination helps to create the completeness. Most scientific men harbor a little distrust of French work. This sentiment is further fostered by the almost systematic neglect of German research on the part of the French. Such a frank exhibition of rancor makes one suspect the impartiality of the French in science generally: indeed, we believe that science has never been so depressed in France as at present. Italy is above her; but Italy, with all her innate ability, is striving to learn from Germany, and has already risen high, and will rise higher. We trust and believe that the present phase of French science which abounds in inefficient work will soon end, and the people terminate their present voluntary isolation. The French stay at home: they used to travel abroad much. Let us hope that they will soon resume their ancient habit, and, above all, that they will re-establish mental intercourse with foreigners. There are *savants* in France who are esteemed throughout the scientific world: may their number rapidly increase!

America's contributions to pure science are by no means very extensive, or often very important: compared with the great volume of German production, they seem almost insignificant. We have never duly fostered research, for we have bestowed upon it neither the proper esteem nor office. There are, we suppose, at least six thousand 'professors' in the United States: are one hundred and fifty of them active investigators? The time seems remote when every American professor will be expected to be also an investigator; but among us is a little band of men who have before them the model of Germany, and who are working earnestly for the intellectual elevation of their country. Their first object is necessarily to render research more important in public estimation, and so to smooth the way for a corps of professional investigators. Every thoughtful person must wish success to the attempt.

CLIMATE IN THE CURE OF CONSUMPTION.[1] — II.

Humidity.

THERE is a unanimity of opinion amongst authorities in regard to the relation of moisture to the production of phthisis. The seventh annual report of the registrar-general of Scotland showed that the death-rate from phthisis diminished in proportion to the dryness of the location. Dr. H. I. Bowditch of Boston has shown that phthisis is prevalent in damp soils in the United States. "It is also common in Holland, and other countries liable to damp fogs and an atmosphere saturated with moisture" (Reynold's System of medicine, iii. 548). Ruehle, in Ziemssen, says, "It appears that moist air favors consumption." Dr. Austin Flint says, "It may be stated that the prevalence of the disease is less in climates either uniformly warm and dry or uniformly cold and dry." And Dr. C. T. Williams writes, "As to the desirability of moist climates for consumptive patients, the evidence is decidedly against their use in the treatment of ordinary chronic phthisis."

If we attempt to explain why it is that phthisis is more prevalent in moist climates than in dry, we might assign as a cause the prevalence of germs, or the impurity of the air, containing the effluvia of decay, or perhaps the greater susceptibility of the system to cold in moist climates; or it may be that the air, being so near saturation, cannot take up the requisite amount of the aqueous vapor exhaled from the lungs. *Causa latet vis est nota* may adequately express the state of our knowledge in regard to this point. A moist climate is acknowledged to be a breeder of phthisis; and, *au contraire*, a dry climate is known to afford a certain exemption from the disease. This is shown by the fact that the disease is rare in Iceland, in the island of Morstrand, on the steppes of Kirghis, and in the interior of Egypt; in all of which places the element of elevation is wanting. It may, then, be conceded, that dryness of the air is an important element in the prophylaxis and cure of phthisis.

The method of determining the humidity of the air is that introduced by Regnault, known as the wet- and dry-bulb test. It can easily be seen that the results obtained will depend on the exposure of the thermometers, and on the accuracy of the readings. Moreover, the amount of moisture that the air is capable of

[1] Concluded from No. 34.