

numbers was 'transferred,' twenty or thirty friends were asked to put prescribed questions and tabulate the results. The results obtained were entirely confirmatory of the so-called number-habit, and "it is clear that this varying predilection for different numbers materially vitiates all reasoning based on the assumption that we shall indifferently choose *any* number." Not only are particular numbers favored, but there are decided tendencies to select numbers on certain principles: here, again, the results first reached by Dr. Minot are corroborated. For example: in 1,120 trials in which multiples of ten would have been selected 109 times by the action of chance, they were actually selected 307 times. When persons were asked to choose a number (no limits being set), it was found, that, in 172 trials, 84 chose numbers under 20; and 59 of these, numbers under 10. Yet, if you set 1,000 as the limit unconsciously implied by each person, numbers under 20 would occur only 3.26, and under 10 only 1.54 times. Again: when limits were set to the numbers to be thought of, there was a strong disposition to avoid early numbers, and select those near the farthest limits. The table recording the result of the numbers persons are most likely to choose is very suggestive, and should be compared with the tables given in Dr. Minot's report.

In short, as was recognized long ago by some psychologists and writers on probabilities, the human mind is not calculated to act like a die-box or a raffling-wheel, and to have numbers *chosen* is a different thing from having them *drawn*. In fact, it is possible to suggest a certain kind of number-preference by the framing of the question. When the question read, 'Choose a number containing *three* figures,' the digit 3 occurred more than twice as often as it should have done by the action of chance. Of course, this phenomenon is not confined to numbers: guessing letters of the alphabet, names of people and towns, and the like, would be very apt to be unusually successful by reason of independent similar brain-functioning. In choosing letters, three tendencies are observed: 1°, to choose A, B, and C (of 172 people, 37 chose A, 31 B, and 14 C); 2°, to choose one's own initial (this was done 27 times in 172 cases); 3°, to choose Z (12 times in 172 cases).

The arguments in favor of supersensory thought-transference would apply as well to the common simultaneous discovery of new points in science by widely separated observers, or even to the similarity in customs of unrelated savage tribes (which Mr. Tylor so interestingly describes and so rationally explains), as to the number-coincidences of the usual 'telepathic' experiments. The same causes that led to the development of the decimal

system, or to the selection of certain numbers as sacred or ill-omened, are still active in creating the preference for certain numbers which is so easily overlooked. Experiments taking this factor into account can be devised, and, when the results still leave a residue of unexplained phenomena, it is time enough to begin to consider the remote possibility of real telepathy. J. J.

#### IS BOTANY A SUITABLE STUDY FOR YOUNG MEN?<sup>1</sup>

AN idea seems to exist in the minds of some young men that botany is not a manly study; that it is merely one of the ornamental branches, suitable enough for young ladies and effeminate youths, but not adapted for able-bodied and vigorous-brained young men who wish to make the best use of their powers. I wish to show that this idea is wholly unfounded, but that, on the contrary, botany ought to be ranked as one of the most useful and most manly of studies, and an important, if not an indispensable, part of a well-rounded education. In support of this view, these four good and cogent reasons can be adduced:—

1. *The study of botany is an admirable mental discipline.* Any education is defective which includes no training in the scientific method of study; that is, in developing the powers of careful, minute observation and comparison in some department of nature. By this means is acquired the habit of investigation, or the seeking-out of nature's mysteries by the use of one's own senses, instead of trusting wholly to the observations of others. This method of study may be learned through any branch of science; but botany presents this advantage, that it can be pursued with less inconvenience and less expense than any other. The mental training which botany affords is very thorough. The details of plant-structure are infinite, and essential peculiarities are often so hidden as to be recognized only by the most minute investigation. This involves the use of the microscope, which every educated man ought to understand, since it reveals to the eye a newly discovered and wonderful world,—a world of which our grandfathers had but the faintest glimpses, but which is scarcely inferior in interest to that larger world which the unaided eye can see. After this training of the powers of perception and comparison, comes the process of generalization, whereby the laws of vegetable life are determined from the study of plant forms and modes of growth. Thus is acquired the habit of

<sup>1</sup> From the first number of *The Swiss Cross*.

inductive reasoning, or the supporting of every general proposition upon a solid foundation of positive, indisputable fact.

Learning the names of plants is but the beginning of the study of botany. It is like learning the names of our companions or schoolmates before we become really acquainted with them. After we have learned to tell plants apart and to call them by name, we have presented for study such problems as the laws governing their distribution, the relation between the floras of different continents, and the relation of variety to species, which introduces the subject of Darwinism. The study of botany also includes the fossil plants, and, by enabling us to trace the vegetable kingdom from its first appearance upon the earth through all the varying conditions of the geologic ages, opens those tremendous scientific questions as to the birth and infancy of this world of ours which we now see in its maturity, and as to what it will become in its old age. These researches afford not only the amplest mental training, but abundant occupation for the longest life.

2. *The study of botany promotes physical development.* The botanical student must be a walker; and his frequent tramps harden his muscles, and strengthen his frame. He must strike off across the fields, penetrate the woods to their secret depths, scramble through swamps, and climb the hills. The fact that he walks with an earnest purpose gives a zest to these rambles; and he comes home proud and happy from his successful search for botanical treasures, with a keen appetite and an invigorated body and mind. He has enjoyed himself more thoroughly, and gained more substantial benefit, than those who have devoted the same time to the bat, the racket, or the bicycle. In his vacations the young botanist can toughen himself by making long and delightful excursions, living all summer in the open air, and may even have opportunities for joining government exploring parties, and enjoying the active out-of-door life full of adventure and useful experience.

3. *The study of botany is of great practical utility.* It is an essential preparation for several important pursuits. The physician and pharmacist need to have a practical knowledge of those plants which are used as medicines; and, if this knowledge is not acquired in early life, the opportunity never afterward presents itself. For the protection of our rapidly dwindling forests, the services of many skilled foresters will soon be required; and the forester must be a practical botanist. So must also the horticulturist, whether professional or amateur. For the most accomplished botanists, who desire to make this their

life-work, there will always be places as instructive in our many colleges.

4. *The study of botany is a source of lifelong happiness.* Whatever may be one's station or pursuit in life, it is a great thing to have an intellectual hobby, which will afford agreeable and elevating occupation in all leisure hours. Botany is one of the best of hobbies. It can be studied out of doors from early spring till the snow falls; and even in winter there is plenty to be done in the analysis of dried specimens and the care of the herbarium. The botanist lives in the fresh air and sunshine; and when he leaves the world behind, and seeks, amid the solitudes of Nature, to penetrate her wondrous mysteries, he feels the quickenings of a higher life. A taste for botany wonderfully enhances the pleasures of travel, and also gives happiness and content to him who stays at home. It is equally efficacious in preventing the *ennui* of wealth and the anxieties of poverty. If one's surroundings are uncongenial, and life proves full of cares and disappointments, it is a great solace to be able to say with Aurora Leigh,

"I was not therefore sad,  
My soul was singing at a work apart."

For these reasons it is obvious that the study of botany is peculiarly rich in those elements which conduce to a vigorous mind and body and a robust character. It is therefore pre-eminently a manly study, and an invaluable part of a young man's education. The student may rest assured that the time and effort devoted to it are well spent; for the result will be to make him a wiser, stronger, more useful, and happier man.

J. F. A. ADAMS, M.D.

#### THE TENDENCY OF CONTEMPORARY GERMAN THOUGHT.

ROBERT ZIMMERMANN, writing of contemporary German literature in the *Athenaeum*, expresses the following opinion as to the philosophic tendency in Germany:—

"Scientific men, particularly physiologists and anthropologists, whose problems involuntarily touch on the domain of philosophy, and in particular of psychology, are yielding to a spiritualistic impulse that attracts them beyond the limits of the material. The science of man, according to the opinion prevalent among naturalists, is a chapter in zoölogy. The 'Entwicklungsgeschichte des menschlichen Geistes,' by Gustav Haeuffe, of which the first part previously published contains 'Anthropology,' traces back the essence of man's nature to an absolute and indissoluble union of the corporeal with the psychic element, the spiritual soul with the material body, — a method that re-