the first book of Horace, fragments of the fourth Æneid, passages from the Metamorphoses and Fasti of Ovid, and the first eclogue of Vergil, will possess the requisite novelty to the class of students for whom this book is professedly intended.

Common Sense Science. By GRANT ALLEN. Boston, Lothrop, 12°.

Studies in Life and Sense. By ANDREW WILSON. London.

IF the question, 'What is the ideal method of popularizing science?' were raised at any of our large scientific meetings, about as many minds as men would probably be heard. Everybody admits the importance of the topic; everybody recognizes that science is all along getting popularized and gradually rendered digestible by the average man: but there is much difference as to the relative value of the several agencies by which this result is being produced, and the direction which these efforts should take in the future. There is a great deal of false popular science, — a class of writing in which the difficult points are always skipped, and the light and temporarily interesting ones unduly magnified; in which the interest is attracted towards certain minor points, and the whole doctrine set forth in a perverted perspective. One can dress up the facts of science in as attractive a garb as one likes; but the aim must be to bring home the fact, and not the study of the costume. The spirit of accuracy by which science is differentiated from uncritical knowing is the *sine qua non* of a real interest in scientific work.

Into what category of 'popular-science' writing one will put this work of Grant Allen's will depend largely on one's conception of the purposes of such literature. The geniality and attractiveness of his style are well known. They are important factors in the success of his works. The present series of essays exhibit the strength and the weakness of this class of writing. Its strength consists in its power to bring home simple truths in a way that suggests their real significance to the average mind; its weakness, in the fact that so much of it is not 'common-sense' science, but 'common-place' science: it says very little for the amount of words.

A striking feature of this and other recent general works is the great *rôle* which psychological subjects are now playing in science. Of the twenty-eight essays here printed, ten are distinctly psychological, and many others partly so. The main reason of this increased interest in the scientific study of mental phenomena is the recognition of their intimate relation with education. We are beginning to appreciate that the requisite for rationally educating the mind is to accurately know it.

It is only just to Mr. Allen to give a sample of some of the essays. A very typical one is that on self-consciousness, the tone of which will be readily gathered from the following sentences: "A philanthropist who had it in his power to abolish, if he chose, with a single wave of his hand, either small-pox or self-consciousness, would probably do more in the end to diminish human suffering and to increase human happiness if he elected to get rid, by an heroic choice, of the less obtrusive but more insidious and all-pervading disease; for small-pox, at the worst, attacks only a very insignificant fraction of the whole community; while every second person that one meets in society, especially below the age of fifty years, is a confirmed sufferer from the pangs of self-consciousness." The essay on memory sets forth in apt illustrations the complexity of human knowledge; that on the balance of nature, the inter-relation between the various classes of organic life. Under the title 'Big and Little,' is a lesson on the relativity of knowledge. The 'Origin of Bowing' traces the gradual refinement of a savage's slavish obeisance into the modern gentlemanly courtesy. 'The Pride of Ignorance' teaches an admirable lesson, as also does the essay on home-life. Other sufficiently suggestive titles are 'Holly and Mistletoe,' 'Sleep,' 'Amusements,' 'Evening Flowers,' 'Genius and Talent,' and so on.

Like all his works, this collection of papers will doubtless find a large and appreciative public. To those who do not already know the facts which it contains, it will offer an attractive method of acquiring them.

The spirit of Dr. Wilson's book is quite a different one. There are many who will listen to Mr. Allen who would not listen to Dr. Wilson; but those who choose the latter will not be sorry for their choice. There is in these essays an unusual amount of information, well and attractively put together. It needs to be read attentively, but leaves the reader with the same feeling of satisfaction that one experiences when rising from a good and substantial meal. There will follow a process of healthy digestion, and the food will contribute some little to the making of its partaker.

Dr. Wilson is a biologist, and the sixteen careful studies contained in this volume touch portions of the entire field, from the 'Inner Life of Plants' and 'The Past and Present of the Cuttlefishes,' to the 'Body and Mind.' In each topic the author writes as one perfectly at home; avoiding the fault of attempting to tell too much, as well as of having too little to tell. It is popular-science writing, a very good type indeed.

Like the former book, this, too, is characterized by a preponderance of psychological subjects. Seven of the essays treat entirely or mainly of mental phenomena, while several others touch upon such topics. 'The Old Phrenology and the New' is an unnecessarily painstaking refutation of the claims of the 'cranial-bump examiners,' with a brief account of the evidence for the modern doctrine of the localization of function in the cortex of the brain. The old phrenology serves as an excellent type of the shoals, on which the hasty wanderer, leaving the straight but slow path of scientific advance, is likely to be wrecked. The nature of the relation between nerve-tissue and mental phenomena is outlined in the paper on body and mind; the main point being to show by striking examples the strange effects produced by intense expectation and concentration, which furnishes the kernel of truth in the claims of the mind-cure. 'The Mind's Mirror' explains the development of the expression of the emotions in animals and men, while 'The Coinages of the Brain' is a timely account of the part played by hallucinations in such happenings as our psychic-research societies are likely to record.

The more strictly biological essays treat of the economies of nature, showing, that, as conditions vary, nature utilizes every trifle, and avoids waste, or scatters tons of pollen over a barren soil. There are two excellent chapters on the zoölogical position of monkeys and elephants; while the volume closes with 'An Invitation to Dinner,' which gives occasion to a lesson on the physiology of digestion.

In the present case the proverbially odious comparison can hardly be avoided. Dr. Wilson's is in every way the better book; but Mr. Allen's will have the wider public, and, it is to be hoped, will incite an appetite that will lead to the searching for the more substantial food.

NOTES AND NEWS.

THE American committee of the International Congress of Geologists — a committee appointed by the American Association — will present a report at the meeting of the American Association in August concerning the positions to be taken by the representatives of American geologists at the next session of the congress in London (1888), upon the more important questions of nomenclature, classification, and coloring, which will there be discussed. It requests that Section E set apart a day for the purpose of considering these questions to be submitted by the committee, and of aiding that body to ascertain the direction of American opinion thereon. In order the better to accomplish this object, it requests Section E to issue an invitation to all American geologists (whether members of the American Association or not) to attend this session and participate in the work. The American committee also request that members of the association be informed of the opportunity offered for obtaining the great geological map of Europe, now preparing by a special committee of the International Congress. This map will be issued in 49 sheets, which, combined, will cover a space about 11 by 12 feet. The price is $20 a copy, with additional charges of duty and expenses amounting to about $6. Incorporated scientific institutions are of course exempt from duty-charges. For further information address Dr. Persifor Frazer, secretary of the American Committee, 201 South Fifth Street, Philadelphia, Penn.

— The Entomological Club of the American Association will meet on the day prior to the meeting of the association, at 2 P.M. The

Brooklyn Entomological Society has appointed a committee to welcome the members of the club, and to assist in making the meetings interesting, as well as to give such information regarding matters of special interest to entomologists as may be desired. The same society will arrange for one or more field-excursions in the vicinity of New York, and a reception will be arranged for. Members of the club intending to contribute papers will please communicate the same to the president, Prof. J. H. Comstock, Ithaca, N.Y., or to the secretary, Mr. E. Baynes Reed, London, Ontario.

— The Botanical Club of the American Association will hold its meetings, as usual, during the week of the association. For particulars address Mrs. E. L. Britton, secretary of the club, Columbia College, New York.

— The Society for the Promotion of Agricultural Science will hold its eighth annual meeting in New York, beginning on Monday evening, Aug. 8, at Columbia College, and continuing on Tuesday. For further information address Prof. W. R. Lazenby, secretary, Ohio State University, Columbus, O.

— The aggregate production of shad for distribution the present season by the United States Fish Commission has been enormous. The number produced has been increasing from season to season, owing to the perfection of the methods in use. A summary of the distribution for the present season, arranged by river-basins, is as follows: —

Penobscot River	1,169,000
Kennebec River	800,000
Tributaries of Narragansett Bay	1,275,000
Hudson River and tributaries	1,979,000
Tributaries of Delaware Bay	5,099,000
Tributaries of Chesapeake Bay	68,149,000
Tributaries of Albemarle Sound	5,322,000
Tributaries of South Atlantic coast	3,566,000
Tributaries of Gulf of Mexico	7,048,000
Inland waters	1,014,000
Total	95,421,000

It will thus be seen that over 68,000,000 young shad-fry have been returned to the waters of Chesapeake Bay. The entire production of the fisheries of the Chesapeake for the present season was about 2,000,000 young shad. It is therefore evident, that, for every mature shad taken from the waters of the Chesapeake, thirty-four young, healthy, and vigorous shad have been returned to those waters. Experiments already made by the commission indicate, that, up to the close of their river-life (the young shad migrating in October), twenty per cent of the fry placed in our rivers will survive, and attain a size of from two to three inches in length. Arrangements have been made by the commission to secure complete statistics of the shad-catch all along the entire coast for the present year, similar statistics having already been collected in 1885 and 1886. Information already in the hands of the commissioner makes it certain that the aggregate production of shad on the coast has been larger the present season than at any time in the last twenty years, but it will be impossible to give the measure of increase. For the Potomac River it is already assured that the increase of 1887 is fully 100,000 shad over that of 1886, and the increase of 1886 over that of 1885 exceeded 100,000. In the Potomac fisheries alone in the last two seasons the increase in shad has been over 250,000; the increase representing a much larger number than the entire catch of 1879, in which year the fisheries of the Potomac reached their lowest ebb.

— Professor Riley, the entomologist of the Department of Agriculture, has made public the result of an exhaustive personal investigation into the habits of the *Phorodon humili*, or hop-louse. His discoveries are expected to prove of great value to hop-growers, as he has succeeded in learning the habitation of this plant-pest during the winter months, and tracing it through the varying stages of insect-life. Before the investigation, it was not known how or where the insect survived the winter. As a result of his inquiries, Professor Riley has satisfied himself that the eggs laid by the female at the close of the summer are deposited in plum-trees, where the insect hatches in the spring, and resides until the third generation. This third brood, unlike its predecessors, is winged, and immediately after development abandons the plum-tree and attacks the hop-vine. In the autumn a counter-migration from the hop-vine to the plum-tree occurs, the winter eggs are deposited, and the cycle of life goes on in the same way. It is a notable fact that in regions where the cultivation of hop-vines is a new industry, the growers have had complete immunity for a while from the pest. In California to-day they are not troubled by it. Professor Riley believes that the *Phorodon humili* has been brought to this country from Europe on plum-stock; and there is reason to believe that the *Phylloxera*, the dreaded grape-pest, was carried from this country to Europe on grape-vine cuttings. Therefore California hop-growers are warned to beware of importing plum-stock from eastern hop-regions. These discoveries render it possible to check the ravages of the hop-louse either by the use of insecticides in the springtime, before the insect has reached the winged state, or by the destruction of the sheltering plum-trees. The experiments will be continued with a view to protecting the hop-vines after they have become infected with the hop-louse.

— The project of holding a summer school of physics at Harvard College this season has been abandoned; but on July 19 and 20 apparatus designed for use in the 'forty-experiment course,' preparatory for admission to Harvard College, will be shown to teachers or others at the Jefferson Physical Laboratory, and questions relating to the experiments will be answered. The same thing will be done for the 'sixty-experiment course' on the second day, July 20.

LETTERS TO THE EDITOR.

*** The attention of scientific men is called to the advantages of the correspondence columns of* SCIENCE *for placing promptly on record brief preliminary notices of their investigations. Twenty copies of the number containing his communication will be furnished free to any correspondent on request.*

The editor will be glad to publish any queries consonant with the character of the journal.

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

Theoretical Meteorology.

A REVIEW of Professor Ferrel's recent work on this subject in *Science* for June 3 furnishes an opportunity to present a few points on this subject. Professor Laughton, ex-president of the Royal Meteorological Society, once said that there was hardly a theory in meteorology that was well established. If this be so, it seems to me there is great danger of putting too much reliance upon mere theory, which does not have a sufficient groundwork of facts. There is special danger of this in meteorology, where the mathematical discussions of gaseous movements and vortices are hedged about with so much difficulty and complication. I am well aware that the views here advanced are opposed to those of many most advanced thinkers in this field, and I only ask an unbiassed hearing.

To my mind there are at least two fundamental errors in this subject, but these are intimately interwoven throughout its warp and woof. These are, first, that there is friction only between the air and the earth, or at least that friction between contiguous air strata may be neglected; second, that conditions and changes of pressure, temperature, and moisture in the atmosphere, are the only causes acting in producing either its general motions or storms.

The objections to the first theory are briefly as follows. At a height of 100 feet, or at the most 200 feet, in a level country, there is no longer friction between the air and earth, but rather between air and air. This is especially the case on the ocean; and here, surely, we would have no waves, if it were not for the friction between air and air. If there were no friction, all storms would take place in a virtual vacuum, and into a vacuum air would tend to flow with about the velocity of sound. Professor Ferrel thinks, that, according to laws of gaseous motion, the earth's atmosphere would leave the poles and heap itself at the equator, but this is prevented by friction with the earth's surface; but, as we have just seen, we need consider only friction of air on air at 100 feet elevation.

The objections to the second theory cannot be set forth as easily as the above. When we are gravely told that the sun heats up a certain portion of the earth's surface, and that in consequence vertical currents are set up which finally bring about a wind of 100 miles an hour, we can but be credulous. As a matter