



SATURDAY, NOVEMBER 13, 1926.

CONTENTS.

| | PAGE |
|---|------|
| Scientific Achievement and Aptitude | 685 |
| Judging Intelligence. By R. J. Bartlett | 687 |
| Melanesian Mythology. By Sidney H. Ray | 688 |
| Photographic Photometry. By T. S. P. | 689 |
| Intermediates. By Prof. J. F. Thorpe, C.B.E., F.R.S. | 689 |
| Our Bookshelf | 690 |
| Letters to the Editor : | |
| River Terraces of the Euphrates.—Prof. W. J. Sollas, F.R.S. | 692 |
| The Transmission of Cutaneous Leishmaniasis to Man from Artificially Infected <i>Phlebotomus papatasi</i> .—Dr. S. Adler and O. Theodor | 692 |
| Science and Psychical Research.—A. A. Campbell Swinton, F.R.S.; W. W. L.; J. Reid Moir | 692 |
| Patent Law and Unemployment.—E. Wyndham Hulme; The Writer of the Article. | 694 |
| Explanation of the Spectra of Metals of the Second Group.—Prof. Meghnad Saha | 695 |
| Absorption Bands in Nitrogen.—Dr. H. Sponer | 696 |
| The Reaction to Flea Bites: Anaphylaxis and Louse Infestation.—Prof. A. D. Peacock | 696 |
| The Antiquity of the Labiate or Mint Family.—Prof. T. D. A. Cockerell | 696 |
| Early Egypt and the Fayum.—Sir Flinders Petrie, F.R.S. | 696 |
| Chlorine Gas Filters in Relation to Reaction Velocity.—Wilfrid Taylor | 697 |
| The Structure of the Continents.—Dr. John W. Evans, C.B.E., F.R.S. | 697 |
| Sterility in the Vegetable Marrow.—John Parkin | 697 |
| Optics and Poetry.—Rev. H. C. Browne | 697 |
| ‘Red Rain’ at Bordighera, Italy.—Prof. G. H. Bryan, F.R.S. | 697 |
| Cretaceous Mammal Skulls from Mongolia. By Dr. William K. Gregory and G. G. Simpson | 698 |
| Properties of Thin Films. By Sir William B. Hardy, F.R.S. | 700 |
| Acclimatisation to High Altitudes. By Dr. J. S. Haldane, F.R.S. | 702 |
| Obituary : | |
| Prof. Edouard Naville. By Dr. H. R. Hall | 703 |
| Dr. Francis Warner | 704 |
| News and Views | 705 |
| Our Astronomical Column | 709 |
| Research Items | 710 |
| The Nutrition of Cattle | 713 |
| Marine Biology at Plymouth. By E. S. R. | 714 |
| University and Educational Intelligence | 715 |
| Contemporary Birthdays | 716 |
| Societies and Academies | 717 |
| Official Publications Received | 719 |
| Diary of Societies and Public Lectures | 719 |

Scientific Achievement and Aptitude.

SCIENTIFIC literature in the United States has of late contained many references to that country's paucity of leading investigators in pure science, as distinct from its applications; and as we have already mentioned (*NATURE*, May 22, 1926, p. 731), the National Academy of Sciences has appointed a special board of trustees to administer a national fund to be raised for supporting research work in that domain. In the June issue of *Nation's Business*, published by the U.S. Bureau of Commerce, Dr. E. E. Slosson discusses this subject in the latter part of an article entitled "Pure Science Pays its Way." Examining the nationality of the Nobel prize-winners in physics, chemistry, physiology or medicine, he finds that out of a total of 72 prize-winners since 1900, Germany can claim 21, British Isles 11, France 10, Holland 6, the United States and Sweden 4 each, Denmark and Switzerland 3 each, Austria, Canada, Italy and Russia 2 each, Belgium and Spain 1 each. A Nobel prize has not yet been awarded outside of Europe and the North American continent. Further, by dividing the number of prize-winners into the number of millions of population, he obtains for each country a number which, he states, may be called "the national index of scientific research": Denmark, Holland and Switzerland 1, Sweden 1.5, Germany and Austria 3, France and the British Isles 4, Belgium 7, Spain and Italy 20, United States 28, and Russia 66.

As a check on this method of gauging national achievement in scientific research, Dr. Slosson selects the more objective plan of analysing the nationality of the discoverers of new chemical elements. Starting with the year 1894, prior to which the United States was not sufficiently developed to compete, he finds that seventeen elements have been discovered, of which seven were found in Great Britain, four in France, two in Germany, and one in each of the countries Austria, Czechoslovakia, Denmark, and the United States. With reference to sciences other than those for which Nobel prizes are rewarded, Dr. Slosson quotes the opinion of the editor of *Science* to the effect that the United States leads the world in biology, geology and astronomy and stands about even with Great Britain and Germany in mathematics and medicine.

The precise significance of Dr. Slosson's figures is not easy to deduce. The nationality of Nobel prize-winners, although a source of elation or depression, according to one's own nationality or proclivity, does not appear to have more than a remote connexion with general national ability or achievement in research; the winners are, in the main, men of genius, who are notoriously very rare, whose occurrence is exceedingly fitful, and the conditions of whose production are very obscure. In obtaining his national index figures, we

Editorial and Publishing Offices:

MACMILLAN & CO., LTD.,
ST. MARTIN'S STREET, LONDON, W.C.2.

NO. 2976, VOL. 118]

think that the author has unwittingly done his own country an injustice; we should omit the coloured population as well as much of the alien immigrant labour, just as we should omit the *moujik* population of Russia. In our opinion, a better index would be obtained by dividing the number of Nobel laureates in each country into the number of people who have enjoyed—or survived—a secondary school education.

The criterion afforded by success in discovery, whether of new elements or other things, appears to be too narrow; it ignores discovery of new methods and new generalisations, which are usually of much greater moment; and it neglects the factor of luck, which often plays an important part. As Galton observed: "When apples are ripe, a trifling event suffices to decide which of them shall first drop off its stick; so a small accident will often determine the scientific man who shall first make and publish a new discovery." It appears to us that a more accurate index would be obtained by analysing the literature-references in such impartial works as the "Progress Reports" published by the Chemical Society; and we commend this suggestion to Dr. Slosson, in case he wishes to pursue the subject. We are, however, not convinced of the general utility, or even of the desirability, of instituting international comparisons, particularly in regard to science, which should know no frontiers; but we recognise that Dr. Slosson, like all good "100 per cent." Americans, is anxious for his country's welfare, and that in diagnosing the ailment, he is also searching for its cause and cure.

The backwardness of the United States in producing leaders of research in pure science has doubtless a plurality of causes, among which *auri sacra fames* may well find a place, side by side with Dr. Slosson's reason that, in recent years, professors have been deprived of much valuable time to devote to research by the enormous influx of students into the universities. These causes, however, are not confined to the United States.

It may be, as E. Renan predicted, that the United States is expiating its original fault of creating a considerable popular instruction without any serious higher instruction; but it appears to be more profitable to think of the future than of the irretrievable past, and of our own shortcomings as well as those of a sister nation. Leaving genius aside, the really important issue is that every progressive nation must give thought to the conditions that favour the provision of efficient research workers. The number of such men is probably never great, but in the mass is not inconsiderable. They appear to come within the class of one in four thousand, which Galton selected as his second order of eminence (the first being men of genius, who represent about one in a million), and it is comforting to note that

he was convinced that their ability is inheritable. The problem is how to produce more. Writing more than half a century ago, Huxley took a pessimistic view of the possibilities: "The great mass of mankind," he said, "have neither the liking, nor the aptitude, for either literary, or scientific, or artistic pursuits; nor, indeed, for excellence of any sort. Their ambition is to go through life with moderate exertion and a fair share of ease, doing common things in a common way."

This opinion is probably shared by most thinkers to-day; nevertheless, we believe that there is more latent interest for knowledge and attainments among the masses than is implied in Huxley's statement. Where Nature fails or stops, nurture may sometimes succeed. The great instrument of education could be used much more effectively than it has been as a winnowing process for sorting out the capables from the incapables; and, if we would be saved from the limbo of drab mediocrity, we must use it not only for developing latent aptitudes, but also for promoting that passion for excellence which is at the basis of all the best work in science, art, letters, and religion.

Judged by these criteria, our schools are sadly deficient; aptitude for learning, native curiosity and the pursuit of inquiries, are too often killed or suppressed by the pedantry of the pedagogue, if they have not already been throttled in the home; and the same educational diet is administered to all, irrespective of ability or inclination. As a result of this treatment, we find that very few adults have either the desire or the capacity for acquiring new knowledge; comparatively few have learned to take a pleasure in their work; and, what is far worse, few have acquired the habit of thought: of viewing things impartially, of comparing, evaluating, and of drawing correct inferences from trustworthy data.

The habit of sober, reflective, critical thought is one of the greatest needs of the time, and the lack of it is reflected almost daily in social and industrial misunderstandings. Whatever good compulsory education has done to the artisan classes, it has not been successful in making them think; and the same may be said of the majority in other classes: most men are as vulnerable as ever to the oratory of speakers of the persuasive, political type, and the authority of the printed word is still an almost universal article of belief.

The habit of independent thought and critical inquiry, the habit of work, and the desire to excel, appear to be the fundamental requirements of any country that aspires to remain in the vanguard. Given these, we have no doubt that a nation will find within its ranks all the ability that it may need for ensuring progress, including that important part of it which depends upon research work in science and its applications.