Catalogue of Scientific Papers. Fourth series (1884–1900). Compiled by the Royal Society. Vol. xiii., A—B. Pp. xcviii+951. (Cambridge University Press, 1914.) Price 2*l.* 10*s.* net.

THE fourth series of the Royal Society's Catalogue of Scientific Papers, of which the present is the first volume, comprises the titles of papers published or read during the period 1884–1900, and concludes the work undertaken by the Royal Society. The catalogue thus completed will contain titles of papers for the whole of the nineteenth century. The continuation of the work is now in the hands of the authorities of the International Catalogue of Scientific Literature, which deals with the titles and subjects of papers published after the end of 1900.

This volume contains 11,551 entries of titles of papers by 2001 authors with the initial A, and 51,720 entries of papers by 6928 authors with the initial B, making a total of 63,271 entries by 8929 authors.

A list of the 1555 serials which have been examined for the preparation of this section of the catalogue, with the abbreviations used for their titles, is given at the beginning of the volume.

The complete risk of printing and publishing the Catalogue of Scientific Papers and the Subject Index has been undertaken by the Cambridge University Press, and we echo the hope of the Catalogue Committee that the circulation of the volumes throughout the scientific world will be large enough to prevent financial loss.

LETTERS TO THE EDITOR.

[*The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts intended for this or any other part of* NATURE. *No notice is taken of anonymous communications.*]

The Peregrine Falcon at the Eyrie.

IN the notice of Mr. Heatherley's "The Peregrine Falcon at the Eyrie" (NATURE, August 6, p. 586), that author is quoted for the previously "unrecorded fact that after the first few days the falcon turned over to the tiercel the duties of her sex, spending his time abroad hunting and bringing the quarry to the tiercel, who remained at home to feed and look after the young." This sentence in its wording appears to treat the falcon as male, the tiercel as female; the reverse being, however, the correct use of these terms. As Harting ("Birds of Shakespeare," p. 52) says: "By the falcon is always understood the female, as distinguished from the tercel, or male, of the peregrine or goshawk."

W. E. HART.

Kilderry, Londonderry, August 7.

MR. HART is quite correct. The term "tiercel" has always been applied to the male peregrine falcon, *cf.* Newton's "Dictionary of Birds" *et passim.* The notice in which the quoted sentence occurs was contributed from the reviewer's sick bed, and he is only now aware that a point of interrogation after "his" and before "time," which was in his original draft, had dropped from his MS. and its omission had escaped him in the proof.

THE REVIEWER.

PRACTICAL EDUCATION.[1]

THE title of Mr. Legge's book is suggestive of a painting in the University of Bologna, in which Science is represented by a female figure with eyes in each of her extended hands. We are so apt to speak of "seeing" when we mean "perceiving" that we forget that the blind can see with their hands, and that science throughout the centuries has achieved most of her triumphs by the knowledge acquired by means of hand-work. It was early explained that the chief educational advantage of manual training was to exercise the hand from childhood as an instrument for acquiring knowledge, and so to create an additional perceptive sense.

Since the years 1887–1890, when hand-work was first introduced as a scientific experiment into elementary schools, and was then proved to be the means of stimulating the intellectual activity of children, making them more alert in all other studies, the advances in this new educational departure, if not rapid, have been unbroken, and have been carried forward in many different directions. The recognition of the value of manual work in the education of children is now very general. Nevertheless, Mr. Legge has devoted some of the few pages of his letterpress in answering those opponents who, in the early history of the movement, charged its advocates with infringing the principles of elementary education, with trenching on technical instruction and prematurely encouraging vocational teaching.

Mr. Legge has successfully refuted all these arguments. In the chapter of his book headed, "The Growth of an Idea," he has not attempted to give anything approaching to a history of the movement, or he would have referred to those early efforts which in 1890 induced the then Education Department to include in the Code of that year regulations for the teaching of hand-work under conditions carrying a Government grant. Indeed, the few short chapters of his book, although well worth reading, are not intended to add anything to what may be found in other treatises. In his own words, "The letterpress is here simply to explain and lead up to the illustrations," which, he states, are designed to give the general public a view of the practical side of the instruction now provided in schools.

These illustrations, more than four hundred in number, admirably fulfil that purpose. They show how varied may be the exercises which are now practised in the conduct of the modern side of elementary schools, and experience has fully borne out his contention that these exercises are all, or nearly all, equally efficient in stimulating the intelligence of children. Indeed, the value of manual training is shown to depend far more on the method of instruction than on the materials employed, or on the models that are made. The illustrations, of which this book largely consists, show children occupied with educational exercises in such diverse materials as wood and metal,

[1] "The Thinking Hand; or, Practical Education in the Elementary School." By J. G. Legge. Pp. x+217. (London: Macmillan and Co., Ltd., 1914.) Price 8*s.* 6*d.* net.

cardboard, rope and cane, leather and stone, and they also show children engaged in housewifery in all its branches, in the construction of simple scientific apparatus, in gardening, and in other forms of hand-work. Of these illustrations we select two, one showing gardening practice at the Morrison County School, and the other the apparatus and models made at St. Michael's County School.

FIG. 1.—School Gardening. Morrison Council School. From "The Thinking Hand."

Not the least instructive section of Mr. Legge's book is that in which are found suggestions for courses of instruction in hygiene, household science, and the care of infants, with syllabuses of cookery and laundry work. These cannot fail to serve as useful guides to many teachers.

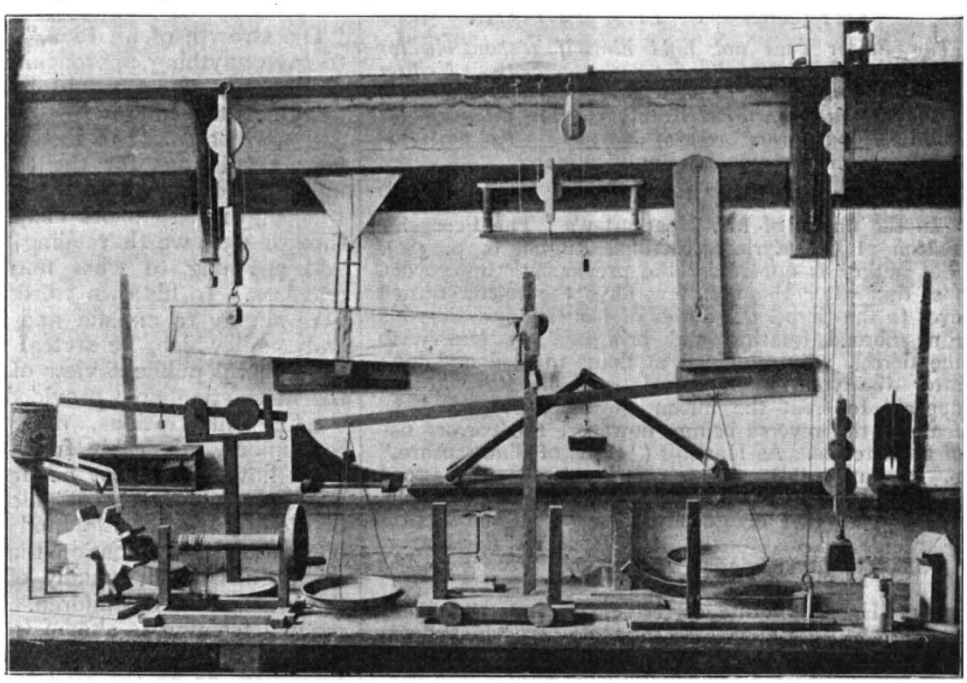

FIG. 2.—School-made Apparatus and Models. St. Michael's Council School. From "The Thinking Hand."

The letterpress, short as it is, covering only 36 out of the 217 pages of which the book consists, contains many tersely expressed conclusions on the value of hand-work and on various matters connected with school administration, which the author's experience as Director of Education of the City of Liverpool has enabled him to form. Very truly he says, "It is a serious question whether the whole system of modern education up to the most recent days has not devoted itself too assiduously to a one-sided intellectual culture." This is so, and the Board of Education, although recognising fully the value of hand-work as a means of educational discipline, has not yet realised the urgent need of giving to manual

training in one or other of its many forms its proper place in the school curriculum.

The author does well to plead for considerable liberty in the teaching of these subjects. Freedom on the part of the teacher to use his own initiative and judgment in determining the exercises to be given to his pupils is essential, for unless he himself is interested in the work in which his pupils are engaged, his instruction will prove of little value. The author is on equally safe ground when he says, "It is not only teachers that call out for liberty; local education authorities are beginning actively to resent the evil of a central bureaucracy drawn tighter and tighter."

Although the number of text-books and essays on manual training already published is very large, we believe Mr. Legge's book will be found to be a valuable addition to the works which teachers and administrators may usefully consult.

THE AUSTRALIAN MEETING OF THE BRITISH ASSOCIATION.

INAUGURAL ADDRESS BY PROF. WILLIAM BATESON, M.A., F.R.S., PRESIDENT.

PART I.—MELBOURNE.

THE outstanding feature of this meeting must be the fact that we are here—in Australia. It is the function of a president to tell the association of advances in science, to speak of the universal rather than of the particular or the temporary. There will be other opportunities of expressing the thoughts which this event must excite in the dullest heart, but it is right that my first words should take account of those achievements of organisation and those acts of national generosity by which it has come to pass that we are assembled in this country. Let us, too, on this occasion, remember that all the effort, and all the goodwill, that binds Australia to Britain would have been powerless to bring about such a result had it not been for those advances in science which have given man a control of the forces of nature. For we are here by virtue of the feats of genius of individual men of science, giant-variations from the common level of our species; and since I am going soon to speak of the significance of individual variation, I cannot introduce that subject better than by calling to remembrance the line of pioneers in chemistry, in physics, and in engineering, by the working of whose rare —or, if you will, abnormal—intellects a meeting of the British Association on this side of the globe has been made physically possible.

I have next to refer to the loss within the year of Sir David Gill, a former president of this association, himself one of the outstanding great. His greatness lay in the power of making big foundations. He built up the Cape Observatory; he organised international geodesy; he conceived and carried through the plans for the photography of the whole sky, a work in which Australia is bearing a conspicuous part. Astronomical observation is now organised on an international scale, and of this great scheme Gill was the heart and soul. His labours have ensured a base from which others will proceed to discovery otherwise impossible. His name will be long remembered with veneration and gratitude.

As the subject of the addresses which I am to deliver here and in Sydney I take *Heredity*. I shall attempt to give the essence of the discoveries made by Mendelian or analytical methods of study, and I shall ask you to contemplate the deductions which these physiological facts suggest in application both to evolutionary theory at large and to the special case of the natural history of human society.

Recognition of the significance of heredity is modern. The term itself in its scientific sense is no older than Herbert Spencer. Animals and plants are formed as pieces of living material split from the body of the parent organisms. Their powers and faculties are fixed in their physiological origin. They are the consequence of a genetic process, and yet it is only lately that this genetic process has become the subject of systematic research and experiment. The curiosity of naturalists has of course always been attracted to such problems; but that accurate knowledge of genetics is of paramount importance in any attempt to understand the nature of living things has only been realised quite lately even by naturalists, and with casual exceptions the laity still know nothing of the matter. Historians debate the past of the human species, and statesmen order its present or profess to guide its future as if the animal man, the unit of their calculations, with his vast diversity of powers, were a homogeneous material, which can be multiplied like shot.

The reason for this neglect lies in ignorance and misunderstanding of the nature of variation; for not until the fact of congenital diversity is grasped, with all that it imports, does knowledge of the system of hereditary transmission stand out as a primary necessity in the construction of any theory of evolution, or any scheme of human polity.

The first full perception of the significance of variation we owe to Darwin. The present generation of evolutionists realises perhaps more fully than did the scientific world in the last century that the theory of evolution had occupied the thoughts of many and found acceptance with not a few before ever the "Origin" appeared. We have come also to the conviction that the principle of natural selection cannot have been the chief factor in delimiting the species of animals and plants, such as we now with fuller knowledge see them actually to be. We are even more sceptical as to the validity of that appeal to changes in the conditions of life as direct causes of modification, upon which latterly at all events Darwin laid much emphasis. But that he was the first to provide a body of fact demonstrating the variability of living things, whatever be its causation, can never be questioned.

There are some older collections of evidence, chiefly the work of the French school, especially of Godron[1] —and I would mention also the almost forgotten essay of Wollaston[2]—these, however, are only fragments in comparison. Darwin regarded variability as a property inherent in living things, and eventually we must consider whether this conception is well founded; but postponing that inquiry for the present, we may declare that with him began a general recognition of variation as a phenomenon widely occurring in nature.

If a population consists of members which are not alike but differentiated, how will their characteristics be distributed among their offspring? This is the problem which the modern student of heredity sets out to investigate. Formerly it was hoped that by the simple inspection of embryological processes the modes of heredity might be ascertained, the actual mechanism by which the offspring is formed from the body of the parent. In that endeavour a noble pile of evidence has been accumulated. All that can be made visible by existing methods has been seen, but we come little

1 "De l'Espèce et des Races dans les Êtres Organisés," 1859.
2 "On the Variation of Species," 1856.