

be ploughed into the soil, and he carefully returns to the land all the produce of the crops that he can. The first process causes the addition to the soil of complex carbohydrate material, cellulose, starch, &c., and of protein synthesised by the plant during its growth; these substances make good the loss of carbon and, in some instances, of nitrogen also, and they further supply stores of energy for the numerous organisms of the soil. The second process involves the collection of animal and human excreta, which are returned to the land under the most favourable conditions. Finally, the crop on the land is allowed a perfectly free field and no competition is tolerated; weeds are rigorously kept down, and the most careful tillage obtains.

We need not go into a detailed consideration of the actual methods, but it comes as a shock to read that practices we thought were initiated in our times have long been common among the Chinese. No one can read the book without being struck by the immense patience and industry of the peasants and the remarkable way in which they have reached the same principles of cultivation as the Western farmer. The book can be cordially recommended to the student of agriculture, who cannot fail to be charmed with the farmers and labourers depicted in its pages.

OUR BOOKSHELF.

The Heat Treatment of Tool Steel: an Illustrated Description of the Physical Changes and Properties Induced in Tool Steel by Heating and Cooling Operations. By Harry Brearley. Pp. xvii+160. (London: Longmans, Green and Co., 1911.) Price 10s. 6d. net.

THE subject of the heat treatment of steel is one which during recent years has received a large amount of attention, and the results of numerous researches in England, on the Continent, and in America have been published before various technical societies. These have, however, for the most part dealt with special branches of the subject, largely from the theoretical point of view, and comparatively little has been published by men who have had to deal with the application of the various theories in their daily practice.

This little treatise, while avoiding the more abstruse theories, brings together in a collected form a great deal of practical information on this important subject, which cannot fail to be of great use both to the practical man and also to those engaged in scientific research. The author, while avoiding any detailed discussion of the various theories of hardening and tempering, has concisely and clearly, if very briefly, explained the phenomenon of recalcence, and the influence of heat-treatment on the structure of steel is illustrated by some excellent photomicrographs.

The chapter on the hardening of typical tools and the special methods of treatment essential to obtain satisfactory results is illustrated by

numerous examples from works practice, some of which are of special interest.

The defects commonly found in tools as the result of heat treatment, their cause and prevention, are discussed in another chapter, and many useful and practical hints and suggestions are given which form a valuable contribution to the literature on heat treatment.

The author states that the practical details have largely been compiled from his works notes, made for his own guidance during twenty-eight years, and, as is almost inevitable in such circumstances, certain portions of the book suffer from their being somewhat disconnected; but this is a small matter, and in no way detracts from its value and usefulness.

F. W. HARBORD.

Le Transformisme et l'Expérience. By É. Rabaud. Pp. vii+315. (Paris: Félix Alcan, 1911.) (Nouvelle Collection Scientifique. Directeur: Emile Borel.) Price 3.50 francs.

THIS is a book on the same general lines as Prof. T. H. Morgan's "Experimental Zoology." The author points out how very slowly, and almost, as it were, reluctantly, evolutionists have become definitely experimental—partly because they were preoccupied with applying the evolution-formula as an interpretation and with following the suggestions it offered of further morphological or physiological research, and partly because biological experimentation is really very difficult. Nowadays, however, ætiological experiments are being conducted in many laboratories, and there are several journals specially devoted to their publication. What the author has done is to supply us with a competent introduction to experimental transformism.

The book is particularly strong in its exposition of the influence of the environment upon the organism, and the chapters dealing with the modifying effects of pressures, the chemical medium, humidity, heat and light, climate, and nutrition are very effective. They bring together in a clear and scholarly way a large number of scattered facts bearing on modification. As it seems to us, the author has allowed himself to become dominated by what is certainly a truth, that the environment holds the organism in its grip, and is continually provoking it to change. He has no room for what seems to us an equally certain truth: that the organism is itself an agent, a creative agent, a self-expressing Proteus. But M. Rabaud has no patience with neo-vitalistic vagaries of this sort. And yet is it quite certain that he has done them justice? His reference to "intervention suprasensible," which neo-vitalists are not committed to, does not suggest a complete understanding.

J. A. T.

Reinforced Concrete Design. By Oscar Faber and P. G. Bowie. Pp. xix+332. (London: Edward Arnold, 1912.) Price 12s. 6d. net.

As the authors point out, the art of designing reinforced concrete structures cannot be acquired solely by studying text-books; practice under