the evidence of Theorell and Swedin[3,4] which indicates that this new enzyme is really identical with peroxidase. We find that in the presence of fresh alcoholic dioxymaleic acid, acetate buffer of pH 4.5, partially purified horse-radish peroxidase and hydrogen peroxide, methyl red/o-carboxy-benzene-azodimethylaniline/ is rapidly oxidized and decolorized. In the absence of dioxymaleic acid the oxidation is slow. Moreover, peroxide need not be added, provided that the solution of dioxymaleic acid, methyl red, acetate buffer and peroxidase is shaken with air. In nitrogen there is no decolorization.

We find that peroxidase, as shown by testing with guaiacol and hydrogen peroxide, is rather rapidly inactivated by buffered dioxymaleic acid, and that this inactivation is retarded by aeration. Inactivated peroxidase is less effective in oxidizing dioxymaleic acid and in decolorizing methyl red than is active peroxidase.

Old alcoholic solutions of dioxymaleic acid give different results from fresh solutions. Here, a mixture of dioxymaleic acid, acetate buffer and peroxidase decolorizes methyl red even in nitrogen, while aeration largely prevents decolorization.

Our explanation of the rapid bleaching of methyl red in the presence of fresh dioxymaleic acid, peroxidase and hydrogen peroxide is that the peroxidase and peroxide convert the dioxymaleic acid into diketosuccinic acid and that the methyl red is oxidized by a coupled reaction. If one shakes dioxymaleic acid solutions in air, it is not necessary to add peroxide, since dioxymaleic acid is spontaneously oxidized and forms peroxide. This is in agreement with the evidence of Theorell and Swedin. Old solutions of dioxymaleic acid already contain peroxide, so that they require no shaking with air. We are not able to tell why shaking with air should retard the decolorization of methyl red in the presence of old dioxymaleic acid.

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THE EFFECT OF GROWTH SUBSTANCES ON THE ROOTING OF BLUEBERRY CUTTINGS

Three experiments have been conducted to study the effect of growth substance on the rooting of summer cuttings of blueberries, *V. corymbosum*. These experiments were carried on in 1937 and 1938, using in all over 2,500 cuttings from eleven different varieties of blueberries. Indole-3-acetic acid and indole-3-proprionic acid were each used dry and in solutions of 5 and 10 mg per liter. Phenyl acetic acid was used only in solutions of 10, 25 and 50 mg per liter. Auxilin was used at the recommended concentration No. 3. Phenyl acetic acid was the only one of the growth substances used which significantly increased the percentage of rooting and the greatest increase was at the medium concentration, 25 mg per liter. The results obtained with auxilin were very poor at the concentration used. The results of the above experiments are in agreement with those of Stanley Johnston's investigations independently conducted at the same time and reported in *Michigan Station Quarterly Bulletin,* 21: 255–8, 1939. From the results thus far obtained it does not seem advisable to recommend the use of growth substance for the rooting of blueberrry cuttings.

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THE IDENTITY OF THE TREE "ANNEDDA"

From your review of "The Englishman's Food"[1] it appears that the authors think the tree (called by the Indians "Annedda") which cured Jacques Cartier's men of scurvy when they were wintering at Stadacona in the winter of 1535–36, was *Sassafras officinale.* The sassafras does not grow anywhere in the Province of Quebec. Its only station in Canada is a relatively narrow strip in southern Ontario and there is no reason to suppose that it ever ranged farther north.

In support of the sassafras as against an evergreen, the authors state, according to the reviewer, that Cartier's notes particularly refer to the fact that the Indians had to wait for the leaves to appear in the spring. Perhaps authority is given for this statement, but no such passage occurs in Biggar's edition of "The Voyages of Jacques Cartier." Furthermore, Cartier says[2] that it was while he was walking on the ice that the Indians told him of the tree which would cure the sickness and two squaws went with him to gather some of it. Nine or ten branches were brought back, and Cartier adds: "They showed us how to grind the bark and leaves and to boil the whole in water."

The identity of the tree Annedda has been much disputed, but from considerations not necessary to discuss here, it seems likely that it was the hemlock, *Tsuga canadensis.*

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THE KIT FOX

In the summer of 1911, T. A. Rocklund and I were camped for one month on the Pennell Ranch in Wallace County, Kansas, adjoining the George A. Allman

[3] H. Theorell and B. Swedin, *Naturwissenschaften,* 27: 95, 1939.

[4] B. Swedin and H. Theorell, *Nature,* 145: 71, 1940.

[1] Science, 91: 217, 1940.

[2] H. P. Biggar, "The Voyages of Jacques Cartier," p. 212–215. Ottawa: The King's Printer, 1924.

Ranch. Mr. Allman was an early settler in the West, had been a government guide, and had shipped tons of fossils to the Smithsonian Institution. He was a very observing man and spent hours recounting to me conditions of wild-life in the early West.

He told me that it was the general custom of the early cattlemen to place poison at all the undevoured buffalo carcasses to destroy the wolves. It was his observation that the little swift foxes were always the first to take the poison. He stated that the gray wolf had not been seen in Kansas since 1879.

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SCIENTIFIC BOOKS

THE SOCIAL ORDER

Human Nature and the Social Order. By E. L. THORNDIKE. xx + 1019 pp. New York: The Macmillan Company. 1940.

THE desirability of bringing the methods and results of the natural sciences to bear on important social problems, though often emphasized, is seldom acted on by the natural scientist in any thoroughgoing way. It takes time and courage to do so. Thorndike's new book shows courage and proves that its author has devoted much time to the study of social problems. Some of them, touching on his own special fields of psychology and education, he has attacked in original investigations. The general aim of the present book is to show how what we already know of biological psychology can be applied to social problems, and how a natural-science background enables us at least to plan an attack upon these problems. Courage is needed when existing knowledge is insufficient to furnish a direct answer. The author often ventures a well-considered judgment even when admittedly unable to offer a fully scientific solution.

The book consists of two main parts, the first, presenting certain accepted findings of psychology (and of genetics) which are especially pertinent to social problems, and the second, considering these problems in some detail. The first part, running to 400 pages, will be welcomed as a systematic account of Thorndike's main contributions to psychology. It treats of the native equipment of man, of the laws of learning, of abilities and motives and their measurement, of individual differences in ability and motivation, and of a projected science of human values.

An ability is best defined in terms of results accomplished under given conditions. So defined, abilities are very specific and particularized. The ability to add 6 and 9 is not completely identical with the ability to add 8 and 7, for an individual may show full mastery of one of these sums and still be quite shaky as regards the other. Instead then of assuming a few great "faculties of the mind," Thorndike starts with these numerous specific abilities and inquires how they can *legitimately* be grouped. The best empirical principle is to place together abilities that are found to exist together in the same individuals, as indicated by the correlation method.

In any sort of ability there are several variables that can be measured, such as speed, quality of work, difficulty of tasks accomplished and width or extent of the ability. In arithmetic, for instance, one person is quicker than another, one is more accurate than another, one can handle examples of greater difficulty, and one can handle a greater variety of easy examples or of examples at any level of difficulty. Since these variables can be measured, ability can be measured, though not always easily or simply.

Motives, or "wants," are treated in the same general way as abilities. In neither case is it possible at present to define and distinguish most of them in terms of the cerebral and other intraorganic operations by which external results are accomplished. Wants are necessarily defined in terms of results wanted under given conditions. We have to start our science of wants by recognizing a great multiplicity of particular wants and we find it difficult to go behind this multiplicity and discover any adequate system of fundamental or inclusive wants. Relatively few concrete human desires belong strictly under the traditional needs for self-preservation and propagation of the species. Many wants have certainly been acquired by the individual in dealing with his physical and social environment. The relative strength of various wants can be estimated from the individual's use of his leisure time and from his expenditure of his money earnings (representing his working time). On the basis of information collected on these two points, the author estimates (p. 135) that

the 16 hours of the waking day of adults in the United States are spent roughly as follows:

25 per cent. for subsistence and perpetuation.
2 " " to avoid or reduce sensory pain.
7 " " for security.
8 " " " the welfare of others.
30 " " " entertainment.
10 " " " companionship and affection.
10 " " " approval.
4 " " " intellectual activity.
2 " " " dominance over others.
2 " " " other wants.

But are psychological variables such as ability and