

super-broddingnagian figure a hundred thousand miles high, with enormous hands, and moon-like eyes fifteen hundred miles across, being visualized in his tinkering with carbon atoms an inch in width.

Notwithstanding the elusive nature of his stock-in-trade, the chemist (with the help of the physicist) has been strikingly successful in separative operations, even when dealing with the ultra-refined differences between isotopes. He has been equally fortunate in unravelling some of the fascinating secrets of the crystal, in dissecting natural molecular structures, and in weaving complex molecular patterns of his own design. Moreover, he has undertaken what the authors term the 'tailoring' of big molecules, such as those of silks and nylons, so as to bring them into arrangements to suit the needs of man. The 'untailored' molecules of plastics also come in for discussion. Finally, there are interesting chapters on the chemistry of photography and foods of the future. The development of soilless plant crops, the application of the growth hormones of plants, and the increasing use of the sea and air as sources of organic material offer fertile domains for speculations on future food supplies.

The epilogue points the moral that although the chemist has made so much progress in the synthesis and marshalling of molecules, yet "the building and the tailoring of the molecules will not of themselves ensure the continuation of civilization. The battle of the conquest of the world is a battle of the spirit of man." In other words, the man of science must be more than a molecular tinker and tailor: he cannot afford, in the interests of civilization, to neglect his wider obligations as a citizen of the world.

This is a modest book that will inform, entertain and stimulate any intelligent person of ordinary education having an interest in the contemporary position and trend of physical science. Layman and expert alike will derive pleasure from the clear and simply phrased expositions of a welter of subjects, ranging from alcohols to metastable states, from chewing-gum to the mastication of rubber, from periscopes to surface reactions, and from guncotton to the dangers of mathematics—to select only a few of the numerous 'untailored' combinations afforded by the index. In these latter days there are many who talk of bringing science to the man in the street: the authors of this book are among the doers.

JOHN READ.

HUMAN INSTINCTS

Are there Human Instincts?

By Prof. T. H. Pear. (Reprinted from the "Bulletin of the John Rylands Library", Vol. 27, No. 1, December 1942.) Pp. 32. (Manchester: Manchester University Press, 1942.) 1s. 6d. net.

THE unfortunate habit (which is apt to persist even among those with a scientific training) of discussing verbal questions as if they were questions of fact has been responsible for much waste of time and paper in controversy over the problem of human instincts. How much of this controversy has been verbal may be seen from the fact that many of the opponents of the conception of human instincts have been willing

to reintroduce essentially the same conception under some new name such as 'drive', 'urge', etc. Yet behind the mists of verbal controversy, as Prof. T. H. Pear reminds us, there is a real problem of fact—whether or not a man's behaviour is the product of a small number of inherited general dispositions such as sex, pugnacity, acquisitiveness, etc., or whether, on the contrary, the system of his motivation is acquired and the apparently deep-seated dispositions are simply reflections of the motives approved by the 'pattern' of the society in which he was born. Obviously both may be true in part, and the question of fact is then the quantitative one of how much of man's behaviour is to be explained in one way and how much in the other.

These questions of fact are perceived by Prof. Pear to remain important ones, although the current of academic fashion has set strongly against the belief in the usefulness of continuation of the discussion of human instincts which took place in the years after McDougall had popularized the conception by his "Introduction to Social Psychology". In the world of practical affairs, decisions momentous for the future are urged on us for reasons which depend not merely on the belief that there are unchangeable human instincts, but even on the idea that certain national groups have inborn characteristics which persist through the ages. To Prof. Pear, it seems that the offering to our people as a guide to international policy of "this grotesque doctrine . . . of national 'instincts'" is sufficient reason for psychologists not to regard the problem of human instincts as a dead one.

There is also the topical and very living question of whether war is caused by instinctive human aggressiveness. This is very seriously bound up with the practical problem of how we are to avoid future wars when the present War is won. That war is a result of instinctive aggressiveness is often assumed by popular writers and by psycho-analysts. It is not generally realized how dubious are the assumptions on which this opinion is based, and how much there is available even to common observation which throws doubt on whether this can be a considerable factor in the causation of war. Prof. Pear very properly points out that part of military training is directed towards developing aggressiveness in the soldier. Part of the object of war propaganda is to increase the aggressive feelings of the civilian. This is not what one would expect if the war situation were the result of the strength of inborn human aggressiveness. One may also consider that if aggressiveness towards the enemy is the approved pattern of behaviour in war-time and co-operativeness towards the enemy is suppressed, it is also true that co-operativeness within the national group is the approved pattern of behaviour in war-time and that aggressiveness within the national group is suppressed. If members of an army are not allowed to fraternize with the enemy, neither are they allowed to fight with each other. Much of the talk about war and human aggressiveness seems to lose sight of this double problem of war attitudes. War might indeed be as well regarded as the supreme example of human co-operativeness as the supreme example of human aggressiveness.

There are still many questions to be asked about human instincts before the problem can be regarded as finally settled.

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