

The student must develop the art of learning by himself from books, because he will have to acquire in this way a great deal more science and technology than can be included in his formal training. If this is achieved, the present overcrowded syllabuses can be shortened by leaving certain parts for subsequent study when required.

Attention is directed to the importance of developing skill in clear explanation of technical matters, both in verbal discussion and in writing. The effective value of a proposal depends not only upon its technical merit but also upon the clarity with which it is communicated.

It is suggested that national service for students who are to read for a degree should be taken between the intermediate examination and Part I of the final degree examination, and that the fighting services should arrange this year to give, in addition to military training, a good practical groundwork similar to that given in the first year of service technical training. The year of national service would then be a valuable addition to the degree course as well as a foundation for future war service, if required.

Personal qualities, judgment, effectiveness, enterprise and determination are so important that they must be considered in the selection of a candidate and must be developed throughout his training.

The address is intended to open a general discussion on engineering education, relating it definitely to the knowledge and qualities which experience shows to be desirable in later engineering work. It contains much new and possibly contentious matter, which, with the discussion on it, should form a useful contribution to the developments which now have to be made in engineering education at all levels.

INVESTIGATION OF FOLK-LIFE IN BRITAIN AND ABROAD

MR. R. U. SAYCE discusses folk-life in his presidential address to Section H (Anthropology). Until about 1914, Britain occupied a well-recognized place in the front rank of folk studies; but since that time it has been falling further and further behind, and appears to a great extent to have lost touch with the developments that have taken place in European countries. A few scholars continue to produce work of distinction; but they lack a common meeting ground, where adequate discussion can stimulate thought and help them to see their special problems in relation to the whole. There are even societies devoted to dialects and place-names, beliefs and customs, dance and song, which have scarcely any contact with one another, although they are all concerned with the culture of the folk. In spite of this fragmentation, we are realizing, as general ethnologists have already done, that a culture must be studied as a whole. This, of course, makes our studies more complex, but also far more interesting. It also needs special training; the student of folk-life must know something of the methods of, and the results achieved by, archaeology, history, psychology, anthropology, to say nothing about architecture, agriculture, technology, etc. There can be little doubt that the present unsatisfactory state of British studies in this field is due largely to the failure of the universities to provide the necessary training.

Folk-culture is very closely related to ethnology and to history, and could only neglect one of these

indispensable allies at great loss to itself. For many years it has enjoyed close contact with ethnology, to which it is greatly indebted; but it has neglected its second essential partner, so much so that it has been in danger of becoming an unimportant appendage of the former. Nevertheless, a very slight knowledge of our problems is sufficient to make it clear that their solution depends on a historical approach. The subject does not consist of an inert mass of survivals from a vague and generalized past. The contents and their vitality change. Sometimes customs and beliefs appear to survive only in remote circles or among the least educated, and these periods may be succeeded by others when irrational ideas spread rapidly and become widely current. We can see fluctuations of this kind in western European civilization as well as in that of ancient Greece.

The impression must not be given that folk-culture deals only with 'primitive thought' and superstition; it includes the whole way of life of the people—their houses, clothes, food, work, and recreations. All these change, sometimes abruptly, at other times almost imperceptibly; old elements drop out, and new ones come in. For a knowledge of the changes we have to turn to a much closer co-operation with historians and archaeologists.

At the present time, certain long-established interpretations of European folk customs are being challenged. A new school of folklorists questions whether the old harvest customs, for example, had any connexion with beliefs in vegetation spirits, and suggests that scholars like Maunhardt and Frazer made insufficient allowance for the spirit of jollity and of competition that would be quite natural where young men and women are for the time working together in the fields. The new school recommends a more modern, functional approach to the problems. There is very much of interest in their arguments, but the question is essentially a historical one. What did the medieval peasant think about the powers that influenced growth and fertility? Did he hold animistic beliefs, or was the hare that dashed out of the last standing corn nothing more than a hare? Until we can answer such questions, it would be as dangerous to apply ideas derived from studies of harvesters during the last century or two to their forerunners of a thousand or two thousand years ago as it would be to accept a modern educated African as a guide to the conceptions and emotions that underlie the age-old tribal customs.

In conclusion, Mr. Sayce makes a strong appeal for properly trained workers in Britain, and for the fullest possible intercourse with scholars in those countries where studies of folk-life have made so much more progress in recent years than they have done in Great Britain.

RECENT ADVANCES IN COLOUR VISION

IN his presidential address to Section I (Physiology), Prof. H. Hartridge discusses recent views on the mechanism of colour vision. Colour vision to-day, he says, is in a situation not very different from that of nutrition half a century ago. The solid constituents of the diet—the proteins, the fats and the carbohydrates—were well known and understood. All major problems concerning them had been solved and there was really little more to be found out about them. Then suddenly the importance of the accessory food factors, the vitamins, began to be disclosed. Sub-

stances, small in amount, became of prime importance in dietetics, and we know to-day how much our health and well-being depend on these accessory food substances.

Atomic physics might be taken as a second example of a branch of science where not many years ago all problems appeared to have been solved and everything to be known. We have only to look back at the last thirty years to realize how very limited our outlook really was in those days.

Human colour perception to-day is in a similar situation, because, until quite recently, most—if not all—known visual phenomena were adequately accounted for either on the three-colour theory of Thomas Young or on the four-colour theory of Ewald Hering. But we are beginning to suspect that things are not quite so simple as they seemed and that there may be present in the human retina certain accessory receptor mechanisms, not embraced by either of these theories, which, however, play an important part in man's colour sense. The questions which now confront us are similar to those which claimed the attention of the early workers on the vitamins.

So far as present evidence goes, there appear to be four additional types of receptor, three of which have a single maximum of activity in the spectrum, which is situated in the yellow, in the blue-green or in the blue. The fourth has two regions of activity: in the extreme red and in the extreme violet; and for this reason may be referred to as 'the crimson receptor' mechanism. These four accessory mechanisms, which play a relatively unimportant part in foveal vision at medium visual angles and at medium light intensities, hold a very different position when these conditions are departed from. Thus in the dichromatic zone of the retinal periphery, at medium light intensities and at the fovea at very high intensities, two of these subsidiary receptor systems, the yellow and the blue, hold a predominant position. On the other hand, at very low light intensities and at very small visual angles, the two receptor types which are most strongly represented are the crimson and the blue-green.

While nearly every phase of human colour perception, when closely examined, discloses evidence of the presence of these supplementary receptors, the idea that there are four of them, or that they have the properties preliminarily assigned to them, may have to be modified in important respects as additional knowledge is acquired.

Lessons of a valuable kind are to be learned from a study of the history of the vitamins; because, whereas only a few years ago a few appeared to suffice, we now have overwhelming evidence that there are many. So it may be with the visual receptors. At this juncture the important point is for us to recognize that accessory receptors are present in the human retina, and then to concentrate attention on the wider problems which their presence involves.

PRESENT-DAY TRENDS IN BRITISH PSYCHOLOGY

PROF. REX KNIGHT, in his presidential address to Section J, remarks that more than sixty years have now passed since the "Encyclopædia Britannica" first published in 1886 Ward's famous article on

"Psychology", which William James at once described as "marking the transition of British psychology from one epoch to another". Ward's article showed that psychology was no longer to be regarded as a branch of analytic or speculative philosophy, but as a positive science concerned with the systematic investigation of matters of fact. Since it appeared, striking changes have occurred in the scope, methods and practical usefulness of psychology in Great Britain.

In scope, there have been five major developments. First, physiological psychology, which everyone except Bain neglected in the 'eighties, has come into its own. This has been due to the advocacy of Sully and James, the general acceptance of the evolutionary theory, the researches of neurologists like Lashley and Sherrington, and the influence of the behaviourists.

Secondly, psychology is no longer preoccupied with cognition. The work of James, McDougall and Freud has developed an intense interest in dynamic psychology, and at least as much attention is now given to the conscious and unconscious motives that underlie thought and behaviour as to the processes which are involved in the acquisition of knowledge itself.

Thirdly, sixty years ago psychologists concerned themselves mainly with human beings, and with human beings who were adult, civilized and normal. Now animal psychology, child psychology, anthropological psychology and abnormal psychology are all prominent features of the psychological landscape, and are receiving much attention.

Fourthly, psychology was generally regarded in 1886 as the study of man as an isolated individual, whereas present-day psychology is much concerned with man as a member of society.

Fifthly, the last sixty years have seen the development of mental tests, which, though originated by Galton before Ward's article appeared in the "Encyclopædia Britannica", have been developed during the present century in Britain chiefly by Spearman, Thomson and Burt.

In method, there have also been five notable changes. First, introspection, which dominated the field in 1886, has been supplemented by observation of behaviour and exploration of the unconscious. Secondly, experimental psychology, which was disparaged by most nineteenth-century British psychologists, has established itself. Thirdly, the anecdotal method, once so common in psychology as well as biology, is under sentence of banishment. Fourthly, field-studies have become as important as laboratory investigations. Fifthly, the statistical principles and techniques appropriate to psychological data have received great attention.

In practical usefulness, psychology in Britain has moved during the period under review from a stage where applied psychology was almost unknown to one where psychology is constantly being applied to the practical problems of public and private life. Educational psychology is now an important ingredient in the training of teachers, and educational psychologists are becoming established members of the staffs of education authorities. Psychiatry is a recognized branch of medicine, and clinical psychologists are employed in many fields. Occupational or industrial psychology, the development of which in Great Britain owed so much to Charles Myers, was used on a large scale in the Second World War, and is now being used in the drive for greater productivity.