events without being immediately aware of them and to store the information and attend to it later; but such information cannot be retained for long. However, there is evidence to show that even when such information never reaches consciousness, it may yet have some effect on thoughts and behaviour.

Various factors operate to produce a selection of what is perceived and attended to most closely. We tend to perceive primarily what we expect is most probable to occur in the circumstances; and our previous experience of similar situations does much to determine the estimation of probability. However, expectation is also affected by the reception of special instructions and information, and by training in what to look for. People may also tend to perceive readily what they desire to perceive or are interested in perceiving; but in such circumstances they may imagine they see what is not actually there. Again, they may be unusually slow to perceive what would be disagreeable to them. But they quickly become aware of sudden and unexpected events which are significant and perhaps potentially dangerous, although they may be slower to perceive fully the exact nature of these events.

It is difficult to perceive anything which is exposed only momentarily, or in very dim illumination, or in the margin of the field of vision. Nevertheless, there is some evidence to show that material exhibited below the normal threshold of vision, of which the observer is not directly conscious, may in some circumstances affect his thoughts or behaviour, and in particular produce reactions of the autonomic nervous system. Attention tends to wander after a time from events of no great interest which recur repeatedly and monotonously, and they may cease to be perceived. A long period of exposure to completely homogeneous surroundings produces a decrease in awareness and the power of discrimination, accompanied in some cases by hallucinations and unpleasant emotional reactions.

Recent physiological evidence as to the nature and functions of the reticular formation in the sub-cortical regions of the brain suggests that impulses from this formation may stimulate the cortex in such a way as to produce both a general arousal of consciousness; and also the direction of specific awareness to events of particular significance to the individual. Cortical impulses in turn may facilitate these activities of the reticular formation, or may inhibit them, for example, in situations associated with the withdrawal of attention, such as those of repeated unvarying stimulation of no interest or importance to the individual. Clearly these findings have considerable significance in relation to the psychology of perception and attention, though our understanding of their exact bearing must await further investigation.

PLANTS ON LAND AND IN THE OCEANS

FOR his presidential address* to Section *K* (Botany), Dr. W. R. G. Atkins prepared an account of the many and varied problems on which he had worked and for which his initial training as a botanist had proved invaluable. Starting with a brief account of his work on the suitability and preservation of the timber and fabrics used for the aeroplanes of the First World War, he passed on to an account of his work after the War for the Imperial Department of Agriculture in India. It was in India that he started his studies on the *p*H of soils and plant juices, work which he later extended in Britain. After his appointment to the staff of the Plymouth Laboratory of the Marine Biological Association, he was able to use *p*H measurements for assessing the total quantity of photosynthesis in water masses in the sea and to initiate complementary chemical hydrographical work at the International Hydrographic Station *E*1—work which has been continued by the staff of the Plymouth Laboratory ever since.

Dr. Atkins then gave an account of his extensive investigation into the penetration of light into the sea, a factor of great importance for the growth of the phytoplankton. These studies were later extended to include measurements of light scattering and of the nature of the light fields to which plants in various environments are subject, both in air and under water. In addition to this work, his interest in the plants of the phytoplankton continued. Anomalies were often apparent when the crop of phytoplankton was estimated from measurements of the utilization of different nutrients. That these anomalies were due to the occurrence on occasion of unsuspectedly large amounts of non-siliceous species was suggested by Dr. Atkins—a hypothesis that his later observations and those of other workers have amply confirmed.

Curious delays in the time of the spring outburst of the phytoplankton when determined by the sudden reduction in phosphate in the water mass were also sometimes observed. These delays did not seem to be due to physical factors, since both the light and temperature were apparently suitable for rapid plant growth. A study of the concentration of silicate and of the various species occurring in the water indicated a sudden influx of a fresh water mass into the area—a phenomenon not apparent from records of the temperature, salinity and phosphate, nor from measurements of the total plant population as measured by chlorophyll estimations. Thus, after thirty years, at least one good reason for the lateness of the phytoplankton crop had become evident. This, however, is not to say that at other times and places changes in the vertical circulation or other factors may not be important. It does, however, indicate the value and necessity of the close integration of studies concerned with the concentration changes of all the known nutrients, the physical factors involved and both the total plant population and the occurrence of individual species.

* Prepared from notes left by Dr. Atkins and read posthumously by Dr. C. P. Spencer, of the Marine Biology Station, University College of North Wales, Bangor.

PATHOGENIC FACTORS IN THE ROOTING SPACE AND THE DEVELOPMENT OF EVEN-AGED PLANTATIONS

IN his presidential address to Section *K** (Forestry), W. R. Day says that the distribution of species of tree within the range grown for economic purposes is closely related to productive capacity as determined by available site types: adequate freedom from acutely damaging infestations and freedom from infections are, plainly, related necessities. Production is based on growth as a natural biological process and its economic value depends partly on rate of growth and partly