of the heart (it must be remembered that we are dealing only with short, sudden emotions in healthy persons); and there is some reason to believe that the form of the capillary pulse changes with the quality of the emotion, "which may some day permit a classification of the emotions according to their physiological effects on the form of the pulse." A detailed investigation into the physiological effects of music on a single subject is embodied in this study. The following study, by Binet and Vaschide, deals with the influence of intellectual work, emotion, and physical work upon the blood pressure, investigated by means of Mosso's sphygmomanometer, which the writer considers of great value; it is shown that all these influences are stimulants of the nervous system, physical work being the most intense, and intellectual work the least intense stimulant. In a subsequent memoir, V. and C. Henri, working on the answers to a *questionnaire* concerning the earliest recollections of childhood, find that the third year is the chief epoch for such recollections, that they are far more often visual than auditory, and that when they are very trivial it has often happened that the really serious emotions, associated with the visual reminiscence, have been forgotten. The following memoirs are by Vaschide, on the Localisation of Memories; by V. Henri, on the Localisation of Tactile Sensations and Aristotle's Experiment; by the same writer, on Psychic and Physical Work and the Factors Involved, with special reference to the labours of Kraepelin and his school; and by Binet, on the "Paradox of Diderot," in which he shows by investigating the experiences of the leading actors at the Comédie Francaise, that emotion plays a real part in the actor's work; and, finally, a study by Binet, founded on the descriptions of the same photograph, furnished by a number of children and noting the various psychological types revealed by such descriptions.

L'Evolution des Idées Générales. Par Th. Ribot. Paris: Alcan. 1897. Pp. 260. Price 5 fr.

The present volume follows closely after the same author's *Psychology of the Emotions*, and while it shows Prof. Ribot's customary ability and erudition in expounding and simplifying psychological problems, it is much less interesting than that volume. The psychology of the emotions opens up so many difficult and fascinating problems, affecting every part

of life and many fields of science, that any fairly adequate discussion of the matter must needs prove generally attractive. The evolution of abstract ideas is a much less impassioning subject, and, moreover, the author has much less new light to throw on it. He mostly contents himself throughout with a methodical summary and lucid presentation of those views of the question with which he is in sympathy, confining himself so far as possible to the evolution of general ideas and ignoring the quarrels of nativists and empiricists as to their essential nature. "This is," he writes, "a study of pure psychology from which everything relating to logic, the theory of knowledge, and philosophy has been strictly eliminated; we are here only concerned with genesis, embryology, evolution. We must therefore rely on observation, and on the facts in which mental work is incarnated and revealed." In pursuance of this evolutional idea, Prof. Ribot seeks his documents among animals, children, uneducated deaf-mutes, primitive and half civilised races, and in the development of scientific notions, theories, and classifications.

Starting from the statement that intellectual activity may always be reduced to one of two types, either association and verification, or dissociation and separation, Ribot finds that abstraction belongs to the second type and is "a natural and necessary process of the mind dependent on attention, that is to say the spontaneous or voluntary limitation of the field of consciousness," and, so far from being rare, is one of the commonest of mental acts. He finds the simplest type of generalisation in the formation of a "generic image," using a simile derived from Galton's composite photographs, and first applied to psychology by Huxley. This generic image results from a *spontaneous* fusion of images, and is produced by the repetition of more or less similar events. It consists in an almost passive process of assimilation, is not intentional, and only deals with the grossest resemblances, of which it is the accumulation and summation, moulded at last into a solid kernel, from which minor differences have fallen away, and which becomes capable of further development. This early evolution is studied through three chapters, in animals, in children, and in deaf-mutes, in regard to whom much material is found in the early work of Gerardo, dating from a period when deaf-mutes were less frequently subjected to education than at present.

After a fairly full and interesting discussion of speech, in the course of which regret is expressed that linguistics has yet received so little attention from psychologists, Ribot passes on to deal with the superior forms of abstraction generally, and then to the evolution of the principal concepts —number, space, time, cause, law and species—to each of which a chapter is devoted. With regard to the conception of number, Ribot appears to be in essential agreement with James that it is primarily the stroke of our attention in the discrimination of things, being thus directly reducible to what the author regards as the essential and fundamental condition of abstraction. Space is traced from its first concrete form in the intuition of definite extension. Time is considered to be a complex state or, rather, process; the vital rhythmic sensations, like respiration, constitute its kernel—"it is an internal chronometer fixed in the depths of our organism"—and to this subjective element are added and co-ordinated other objective elements, the regular successions arising from external sensations, and forming the envelope of the kernel. The conception of cause is briefly developed from its primitive form in experience as a force, a power which acts and produces, to its final development in the law of universal causality.

In the concluding chapter the author points out that the progressive march of abstraction and generalisation depends on two principal causes, the first (of general character) being its utility, the second (more accidental and sporadic) the appearance of discoveries, corresponding to spontaneous variations in evolutionary biology. The development of abstraction is thus due to social causes—to utility and to imitation. If the progress of abstraction, from its lowest to its highest stages, is considered from another point of view in relation to its aims, it is found to have followed three main directions in its historical course: practical, speculative, scientific. It is to a considerable degree an unconscious process, and the author concludes that the psychology of abstraction and generalisation is in large part the psychology of the unconscious.

It may be added that this volume is a summary of lectures delivered at the College of France during 1895, and that it is the first of a series which Prof. Ribot hopes to publish, dealing with the whole range of psychology: the unconscious, perception, images, will, movement, etc.