as it is, and without any belief that what it is must be determined by some relation, positive or negative, to what we should like it to be, or to what we can easily imagine it to be."

Emphasis has been laid on those elements in this volume which suggest what should be the general attitude towards scientific investigation in whatever particular sphere. Much scientific work is by no means free from bias and preformed opinions, and it is perhaps inevitable that it should be so, mental life being what the psychologist knows it to be. Nevertheless, the mental attitude towards phenomena indicated in the above quotation may well be the ideal at which the scientist aims, however difficult it may be in practice.

To do this volume full justice, however, it should be mentioned that several essays are more technical in character, and will thus be of special value and interest to the student of philosophy. The following titles will serve to indicate sufficiently the full scope of this collection, *viz.*, "The Ultimate Constituents of Matter," "The Relation of Sense-data to Physics," "The Notion of Cause," and "Knowledge by Acquaintance and Knowledge by Description." H. DEVINE.

Essays in Scientific Synthesis. By EUGENIO RIGNANO. Translated by J. W. GREENSTREET, M.A. London: Allen & Unwin, 1918. Pp. 254. Price *7s. 6d.* net.

Sig. Rignano, of Milan, is the able and energetic editor of the international review, *Scientia*, published in Italy, and he has shown himself indefatigable during the war in bringing together distinguished scientific and philosophical contributors to his review. He is also, however, a remarkable thinker and writer whose penetrating and suggestive essays seldom fail to throw light on old questions or to advance new questions. He excels in showing how one branch of scientific activity may fertilise or illuminate another branch. This attitude of mind is revealed, as indeed the title indicates, in the present volume, which consists of a series of separate studies on the *rôle* of the theorist in biology and sociology, the synthetic value of the evolution theory, biological memory, the mnemic nature of affective tendencies, the nature of consciousness, the religious phenomenon, historic materialism and socialism. Diverse as the subjects may seem, the spirit and object, as the author points out in the preface to the English edition, are the same: "That of demonstrating the utility in the biological, psychological, and sociological fields of the theorist, who, without having specialised in any particular subdivision of science, may nevertheless bring into those spheres that synthetic and unifying vision which is brought by the theorist-mathematician with so much success into the physico-chemical field of science." In the introductory essay the author sets forth clearly the beneficial part which the theorist, able to embrace impartially the opposing views due to the inevitable limitation of the specialist, may play in the advance of science. He refers, for instance, to the problem aroused by vitalism, to the contests between physiologists and psychologists, both in part right, concerning affective phenomena, to the attempts of psychologists and sociologists to appropriate exclusively the phenomena of religion which rightly

belong to both, and he adopts the mnemic theory—now gaining increased support in its reconciliation of the advocates and opponents of the transmission of acquired characters—which he uses fruitfully in some of the subsequent chapters.

The mnemic theory, with its insistence on the organic impress of habit, is visible, indeed, in the following essay on the synthetic value of the evolution theory. Summarising the contest between the preformist and the epigenetist, each of whom can bring forward a long series of facts which tell dead against the other, Rignano finds support for his own centro-epigenetic theory (set forth in an earlier volume), according to which the development of each part would depend not on that of all the other parts of the soma, but rather on the continuous action which the germinal substance of the central zone exercises on the rest of the organism during development. The wonderful phenomena of the recapitulation of phylogenesis by ontogenesis, he insists, is simply an aspect of an essentially mnemic phenomenon, a sign that the living substance remembers all the stages through which the species has passed in consequence of the continuous acquisition of new characters successively added to the old. Here, in "this affirmation of profound and unsuspected analogies between the vital phenomenon in general and the mnemic phenomenon, enabling us to conceive of the latter as the fundamental substratum and inner essence of the former," we have "an imposing synthesis of biology and psychology." "All vital phenomena are also mnemic."

In the essay which follows, the author summarises clearly his centro-epigenetic theory, confronting it with many established facts, and argues that the law of the recapitulation of phylogenesis by ontogenesis is the immediate consequence of the transmissibility of acquired characters in the mnemic sense, as understood by Hering, Semon, Butler, and Francis Darwin, the mnemic faculty being the corner-stone of the centro-epigenetic hypothesis.

An instructive and searching study follows of the mnemic origin and nature of the affective tendencies. In a certain sense Rignano would accept a somatic or visceral basis for the fundamental affective tendencies, constituted by "an infinite number of elementary specific accumulations, differing from point to point of the body, and whose combined potential energy would form, as it were, a force of gravitation." Hence special affectivities originating by way of "habit." Everywhere we find verification of Lehmann's law of "the indispensability of the habitual," which he established for every stimulus to which one grows accustomed, and in the absence of which we become conscious of a "need." Maternal affection, as resting upon lactation, is here instanced. We must attribute a similar mnemic origin, the author believes, to all the affective tendencies, since the innate and the acquired do not differ in their nature. "Habit is second nature," and that adage must be completed by the inverse axiom—"Nature is nothing but first habit." In this connection Rignano (like Stout) insists on the important distinction between affective tendencies and emotion, and criticises the confusion into which Sherrington has fallen at this point. Every emotion presupposes an affective tendency, but an affective tendency by no means necessarily involves an emotion. If we see a vehicle

approaching in the distance an affective tendency leads us to step calmly out of the way; if it suddenly comes on us round a corner we experience an emotion and dart out of the way. It is not the *emotion* which impels us, it is the *affective tendency;* the emotion is but the reaction of a too rapid or intense realisation of the affective tendency. The will, Rignano declares (in harmony with Maudsley), is nothing but a true and characteristic affective tendency. "The mnemic property, the property of 'specific accumulation,' is everywhere present in organic nature, and makes the world of life a world apart, of which the most essential characteristics cannot consequently be explained by the laws of physics and chemistry alone."

What is consciousness? This is the subject of another study, and the author concludes that a psychic state is not in itself either conscious or unconscious, but becomes one or the other in relation to some other psychic state. Consciousness is thus not an intrinsic and absolute property, but extrinsic and relative.

In dealing with religious phenomena, Rignano attaches primary importance to the propitiatory attitude as unknown in animals (though surely one may see it clearly in the domesticated dog), but appearing early in the struggle between man and man. "The first man who threw himself prostrate, but no longer before another man, was the first believer and the first founder of all religions." Other elements, it is admitted, become associated, but propitiation assumed struggle, and also assumed that something was to be gained by the weaker from the stronger party, who might be turned into an ally or protector. In keeping this weaker party in parasitic subjection the stronger party could make use of religion to fortify his power, for religion tends, as Reinach remarks, to become an aggregate of taboos. All law thus has a religious origin, and the social order at first rests entirely on religion. In developing his exposition the author insists much on the primitive importance of war: "No social activity set the religious organ in motion more notably than war," which we must consider as "the greatest, the most universal, and the most fundamental of all social activities." Let it be added at once that the author believes that "war is condemned to disappear," like cannibalism; as also religion (except in so far as it is the sweet and intimate consolation of the individual soul) is condemned to disappear, since both war and religion gain their power from primitive social conditions which are now passing away. It may, however, be pointed out that the view here accepted as to the immense significance of war in primitive society is contested. It is not accepted by many distinguished sociologists. There are many good reasons for believing that war only developed very slowly; even to-day among savages in the most various parts of the world war is not a serious matter, and Sig. Rignano would be well advised to study the powerful arguments and array of facts brought together by the Finnish sociologist Rudolf Holsti four years ago in his book (published in English) on *The Relation of War to the Origin of the State.*

While, however, it is sometimes possible to differ from the author, there can be no difference of opinion as to the suggestive and stimulating value of his vigorous and thoughtful book, which is nearly always well abreast of current research and speculation. HAVELOCK ELLIS.