

LETTER TO THE EDITOR.

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History as a Science.

THERE have lately appeared in NATURE suggestive summaries of addresses by Sir H. Roscoe, Dr. D. J. Hill and Prof. Ramsay on, respectively, "The Work of the London University," "The Extension of Knowledge" and "The Functions of a University," together with various other papers of an educational character. And to these I would beg permission to add some remarks on the importance of the recognition and endowment, in this country also, of history as a science. Three things are required to make of a body of knowledge a science: (1) verifiability of statements; (2) sufficient length and breadth of survey to make possible the discovery of laws, or verifiable generalisations; and (3) the actual discovery, or an approximation to the discovery, of one or more laws of the facts constituting the body of knowledge considered. But history, as it is commonly studied and taught in British Universities, embraces such brief periods that it can, at best, be characterised only by the most elementary of these three requirements. In geology we have had a science of earth's history since the discovery of the law of the succession of strata. In anthropology we have not, as yet, a science of man's history, seeing that the law of the succession of civilisations has not yet been discovered, or has not, at least, yet been adequately verified. The first object, however, of this letter is briefly to point out that, though the science of man's history would be the most complex of the sciences of evolution, yet the immensely varied results of the researches of the last half, and particularly of the last quarter, of the nineteenth century do bring within the scope of reasonable aims the discovery and verification of general laws of history, with all the incalculable consequences which would therefrom follow in the power given to interpret the past, to guide the present and to forecast the future. And the further object of this letter is to urge that, endowed as the study of history as a science is in all the greater Universities, both of Europe and of America, it should at length be adequately endowed also in British Universities, and more especially in those of Scotland, now so munificently endowed, and whose sons, since Adam Smith, in his "Wealth of Nations," David Hume, in his "Natural History of Religion," and John Millar, in his "Origin of Ranks," have been among the foremost workers and discoverers in this *Scientia Scientiarum*.

But theories of history have also their history. And we may better appreciate the argument for the endowment, at length, of chairs of general history—of history studied with such generality as to make possible the discovery of laws, or, in a word, of history as a science—if we cast a glance on the history of general studies of history during the last century and a half. We shall find it clearly divisible into three periods, on the third of which we are now entering. In all these periods, indeed, two great directions, or rather two great methods of historical research, may be noted—the one synthetic and speculative, the other analytic and inductive. But of the former character was more distinctively the method of the first period, of the latter character the method of the second period, and again, but with incomparably more justification, considering the enormous wealth of facts accumulated in the second period, the third period promises to be, while distinctively synthetic, verifiable in its syntheses.

The first period may be dated from Turgot's second discourse at the Sorbonne, "Sur les Progrès successifs de l'Esprit Humain" (1750), and especially from Hume's "Dialogues on Natural Religion," written about the same time, and his later-written "Natural History of Religion" (1757). This synthetic and speculative era culminated in the philosophies of Hegel and of Comte—for Comte's philosophy is entitled to be called "positive" rather because of its speculative dogmatism than of its inductive verifiability. And around these giants of the forest there grew up such a luxuriance of minor "philosophies of history" as produced a reaction against all general views of history—a reaction from which we, in Great Britain, have unfortunately been the latest to recover.

But among Hume's contemporaries and friends were two

masters of the other mode of historical research—the analytic and inductive—Adam Smith and John Millar. From their time to ours the drudging brother has conducted his researches side by side with the high-flying brother, each too apt to sneer at the other, though the function of each was indispensable for the success of the great quest consciously or unconsciously common to both. To the aid of inductive rather than of speculative historical research came, after 1859, the "Origin of Species" year—the immense development of the general theory of evolution which added to the theory of kosmological evolution suggested by Kant and Laplace the theory of biological evolution elaborated by Darwin and Wallace. Simultaneously with the development of this more complex theory of evolution, the researches into man's psychical as well as physical history have had the most fruitful results. And these are now being more and more clearly seen to be contributions to a theory of anthropological evolution which will transform unverifiable, or but partially verifiable, "philosophies of history" into a science of history, conceived at length as the most complex of the verifiable evolutionary sciences.

The chief, perhaps, of the contributions to such a science of history may be thus briefly summarised. (1) The ethnological discoveries, which have resulted in a theory of the origins of civilisation in a conflict of higher and lower races. (2) The folklorist discoveries, generalised in a theory of primitive conceptions of nature as conceptions of its solidarity through the interaction and limitless transformation of its parts. (3) The logical and psychological discoveries, which have verified the "Secret of Hegel," or the theory of the process of thought, both individual and historical, as an advance through differentiation to a higher integration. (4) The physical discoveries generalised in the principle of the conservation of energy, and hence in a theory of scientific conceptions of nature as still, even as primitively, conceptions of its solidarity through the interaction of its parts, but now with the profoundly important substitution of the notion of *proved* equivalent, for *supposed* limitless transformation. And (5) the historical discoveries resulting in a theory of civilisation as a process with dateable (as yet no doubt only approximately dateable) beginnings under definable conditions; as a process the astonishing unity of which becomes more and more apparent with the progress of the researches which have demonstrated the derivation, certainly, of Semitic, and, almost certainly, of Chinese, from Chaldean civilisation; the later derivation of Aryan, through Pelasgian, from the connected Chaldean and Egyptian civilisations; and the derivation possibly (as I personally venture to think probably) of the civilisations also of the New from certain of those of the Old World; and, finally, as a process the unity of which further appears in such correlations and synchronisms of development as that illustrated, for instance, in what I have called the moral revolution of the sixth (or fifth-sixth) century B.C., in all the countries of civilisation from the Hoangho to the Tiber, and which has been more and more fully verified since I pointed it out in 1873 ("The New Philosophy of History"). The other theories I have referred to may, or may not, be found fully verifiable. But surely it may reasonably be anticipated that, from consideration of the ever-accumulating facts of these five great classes, we shall sooner or later discover general laws of history—laws of racial evolution, of intellectual development and of social progress—and draw from them results of the highest possible importance for the interpretation of the past, the guidance of the present, and the forecasting of the future?

But, if so, and if I have thus succeeded in showing that the discovery and verification of general laws of history is now brought within the scope of reasonable aims, it should be unnecessary for me to waste many words on the more practical object of this letter, viz. to urge that, endowed as the study of history as a science is in all the greater Universities of our European and American rivals, it should at length be adequately endowed also in the Universities of England, and more especially, perhaps, of Scotland. For, as Lord Rosebery has over and over again said—for instance, the other day (May 15) at a meeting of the University of London—"The struggle of this coming century will not be one so much of brute force as of trained intelligence. . . . No nations are satisfied with the standard of education that prevailed twenty-five years ago. Every nation demands a more keen and more trained and, if I may use the adjective, a more versatile intelligence than that which was adequate for the business methods of the Empire in

former days. In other words, we have to meet much keener competition in every department of life. And I hope, though perhaps not with much confidence, that all our educational institutions are recognising that fact and preparing to furbish up their somewhat antiquated methods to meet the demands of modern civilisation and modern competition." And at the same meeting the Vice-Chancellor, Sir Henry Roscoe, said, "If we are to meet successfully the constant changes of thought and manner of life to which a highly-organised society is increasingly liable, our Universities must not be content with giving instruction or testing attainment, however high, but must make real contribution to the knowledge which alone, in some form or other, will be a guarantee of the stability of that society."

I shall only add that the endowment and teaching of history as a science, the most complex of the sciences of evolution, should renew and vivify the teaching of all other sciences. For as the sciences of evolution, the metamorphic sciences as I would call them, are founded on the physical sciences, the ethical sciences are founded on the metamorphic sciences, and especially on that highest and most complex of all these sciences, the science of history, or science of anthropological evolution. More particularly within the scope of the more general or anthropological professorships of history it would come to set forth in their due connection, and in the inferences to be drawn from them, the great, yet hitherto, in this country, hardly known and wholly unappreciated, results of modern research with respect to the origin and history of civilisation. From such chairs also the keynote would be struck which would give a cooperating harmony to the work of every minor chair in the great faculty of history. For a general theory of civilisation, a theory aiming at setting forth the laws of man's history, would touch the whole circle of historical studies. Every special chair, therefore, of the faculty of history would be a centre of fruitful scientific criticism of whatever theory might be put forth from the chair of general history or sociology (if such should be its title). Imagine the result in new knowledge of such an interworking of generalising theory and verifying research! Were the faculties of our Universities, or even of one of them, reorganised as the contemporary development of the idea of evolution demands, what a school of cooperating workers would thus be created! From standing lowest among the great Powers in organisation and encouragement of intellectual work, Great Britain would take her place as highest! "Lords and Gentlemen of England! consider what nation it is whereof ye are, and whereof ye are the governors, a nation not slow and dull, but of a quick, ingenious and piercing spirit; acute to invent, subtle and sinewy to discourse, not beneath the reach of any point the highest that human capacity can soar to." And what lacks there in order to our showing ourselves worthy of this noble adoration of Milton's but such institutions as our Universities might be if organised, not as I suggest, but as the idea of evolution demands? J. S. STUART-GLENNIE.

THE CONGRESS ON TUBERCULOSIS.

THE most sanguine expectations of those who have been responsible for the organisation of the British Congress on Tuberculosis could scarcely have led them to anticipate that such a remarkable success would attend their efforts as that which has been achieved. The work of some of these congresses appeals almost entirely to experts, whilst that of others has its interest only for the popular mind. Where, however, such a question as tuberculosis is concerned, the interests involved are so great and far-reaching that the medical man, the dabbler in science and the man in the street are all alike interested and fascinated. From Prof. Koch's splendid address, delivered on the first working day of the Congress, to the practical closing resolutions submitted to the Congress on Friday, those who attended would be ill to please did they not consider themselves provided with subjects for most interesting discussion.

One of the most important items in the success of the Congress was Prof. Koch's address, in which, in masterly fashion, he enumerated the various steps to be taken for the gradual elimination of tubercular process. The very fact that he resiled from one of his original positions—

that bovine and human tubercle bacilli are practically identical—aroused such interest that, had no other single subject been discussed, the success of the congress would have been assured, and Prof. Koch is to be congratulated on raising a subject of such vital importance. It cannot but be felt, however, that the experimental evidence on which his opinion is founded is scarcely sufficient to warrant such a sweeping generalisation as that put forward; whilst the clinical evidence brought forward is even less convincing.

The experimental evidence can only be allowed to stand or be controverted on the production of positive evidence that bovine tuberculosis is communicable to man. Such evidence was at once forthcoming, Dr. Ravenel of Philadelphia bringing forward three cases of such infection that had come under his personal observation; one of the patients died, whilst in one more at least the bovine tubercle bacillus was recovered from the local lesion. These cases are, of course, of very great importance, and now that doubt has been thrown on the possibility of such infection, a most careful outlook will, in future, be kept for similar cases. From the clinical side, Prof. Koch's evidence is not convincing, especially as he maintains that no tubercular lesion can be accepted as arising in connection with the intestinal canal in which some effect is not produced on the mucous membrane. It appears to be the experience of pathologists who have examined a large number of cases of abdominal tuberculosis (tabes mesenterica) that a certain proportion, at any rate, whilst showing no local lesions such as ulceration or swelling of the mucous membrane itself, give abundant evidence of invasion of the mesenteric glands, and in a certain proportion of these cases the mesenteric glands only are affected, this proportion ranging from 14 per cent. (Woodhead) to 28 or 29 per cent. (Shennan and Still). Such affection of the lymphatic glands can scarcely be explained on any other assumption than that the infection has taken place from the alimentary canal, whilst there seems to be further collateral evidence that, in some of these cases at any rate, the infective material has been introduced through the agency of cow's milk. So strong is this evidence that most pathologists, on this ground alone, appear to have considerable hesitation in accepting Koch's statements without very careful corroboration, and it is to be hoped that in England, as in Germany and America, the matter will be put to the test as soon as possible. It should be mentioned that Prof. Virchow, one of the greatest authorities on tubercle, is by no means satisfied of the accuracy of Koch's conclusions on this matter. Whatever may be the result of future investigations, however, Prof. Koch may be most heartily congratulated on the courage and lucidity with which he expounded his views and on the interest that he has aroused in the question by the firing off of his bombshell, as it has been called.

The following remarks made by Lord Lister after Prof. Koch's address are of especial interest:—

Lord Lister said the discourse they had listened to was full of profound interest from the beginning to the end. But what had chiefly riveted their attention had been the startling thesis that bovine tubercle could not develop in the human body. This was a matter of enormous practical importance, because, if this conclusion were sound, it would greatly simplify their preventive measures; but it would be a very serious and grievous thing if the rules now in force for securing purity of milk supply should be relaxed and it should turn out after all that the conclusion was erroneous. For his own part he thought the evidence adduced by Dr. Koch to show that human tubercle could not be communicated to bovine animals very conclusive. At the same time he agreed with him that in a matter of such great importance further inquiry was desirable. But even if that were established it would by no means necessarily follow that bovine tubercle could not be communicated to man. He took in illustration the case of variola. Attempts to inoculate human