

scientific aspect of these problems. He writes well, says some things very forcibly, but repeats himself *ad nauseam*, crowds his pages with commonplaces, and warps his exposition by an irrelevant and forced introduction of religious considerations. With this survey of the strength and the weakness of the work, a glimpse at its contents will be in order.

In the introductory chapters, on the nature and the function of thought, the only point of note is, that, while the author fully recognizes the significance of mind in animals for the understanding of mind in man, he erects a barrier between them which the evolutionary point of view demanded by the topic finds inconsistent. This distinction between a lower and a higher field of thought, — the two sharply defined, — while of advantage in accenting the peculiarity of human evolution, is yet a decided hinderance to the taking of that general point of view which imbues mental evolution with a larger interest. Hereupon follow a chapter on language, and one on temper, containing much sound advice, but nothing noteworthy. The next four chapters aim to justify the titlepage, and deal respectively with babyhood, infancy, childhood, and youth. The characteristics of each of these periods are pleasingly sketched; but the sketch is incomplete, and dwells in a disproportionate manner upon the moral-religious side of the question. He believes in the careful training of children from their first days; denounces the practice of giving children to the care of ignorant nurses when they are supposed not to be affected by their surroundings, but are really forming habits of character for ill or good. A very apt saying is the author's remark that much that is learned in childhood is not taught, and much that is taught is not learned. And the reason for this he rightly finds in the fact that the child, in his own acquisitions, discovers (by repeated trial and failure, it is true) the natural mode of learning, with interest, timeliness, utility, and attractiveness to help him; while the teacher too often accentuates the artificiality of his task.

The latter half of the volume is devoted to chapters on the habit of thought, on the control of the thinking faculty, on memory, on judgment, on inherited capabilities, and on the early training of the mind, and, to a much too large extent, is a repetition of the first half of the book. In the chapter on inherited capabilities the writer exhibits a tendency which he has in common with other thinkers of the day. The writers in question are unwilling to dispense with the rich suggestiveness of the evolutionary point of view, and the light shed upon mental phenomena by the consideration of their physical substrata, but are equally unwilling to give up the general theories — partly religious and partly not — inculcated in their early training, but really incompatible with a consistent evolutionary treatment. The result is at times a curious mixture. The arbitrary curtailing of the evolutionary principle at one point, and an omission to carry to its full consequence the general principle with which it is at variance, give the appearance of a harmony which a deeper consideration shows to be due, not to the fact that the two lines do not run in opposite directions, but that they have been carefully kept from meeting. Mr. Wall is afraid, that, if we admit that our moral and other qualities are to some extent hereditary, this will loosen the bonds of responsibility, and do other moral havoc (a fear, by the way, not at all justified by the history of morality, which clearly shows that new duties follow in the wake of new knowledge), and so refuses to accept the doctrine. In this attempted refutation he draws heavily on preconception instead of on logic and fact. He boldly announces that the child before birth has no life at all, a statement which no biologist will accept; speaks of 'phrenology' as though it were adhered to by scientific men; raises the will into a metaphysical entity, and makes it dominate the reason (as though the former were not a brain quality in the same sense as that in which he acknowledges the latter to be); and refers what we usually call inheritance to early educational influence and the different use of faculties originally alike. In short, the chapter lamentably illustrates the hopelessness of serving two masters.

To leave the reader with a brief verdict of the book, let it be said that it will be suggestive to those interested in this line of thought, but cannot be recommended to those desirous of learning in a short time the modern view of this problem; but with this verdict one must remember the inherent difficulty of the problem, and the

fact that the author pleads temporary blindness as an excuse for the literary shortcomings of the work.

Public Debts. An Essay in the Science of Finance. By HENRY C. ADAMS, Ph.D. New York, Appleton. 8°.

POLITICAL economy in the United States appears to have followed the order of development which Auguste Comte maintained was the law of evolution for all science. We have first the 'theological' stage of science. Certain *a priori* ideas regarding the nature of Deity serve as premises from which conclusions are drawn regarding the phenomena of the industrial world. Carey gives an example of this when he argues from the goodness of God that the Malthusian theory cannot be true. Perry's 'Text-Book of Political Economy' is, however, the best illustration in current economic literature of what is meant by the theological stage of science.

The second stage in the evolution of science was called by Comte the 'metaphysical.' *A priori* ideas still furnish premises for conclusions, but they are not theological: rather are they hypotheses concerning the mind of man and the material universe, which have been derived from processes of reflection. Facts are made to square with theories; and in case they cannot be made to do this, why — "so much the worse for the facts." The English orthodox political economy was well described by Comte's metaphysical stage of science; and with the theological political economy this held sway — almost undisputed sway — in the United States until some fifteen years ago. Its most distinguished representatives declared that it was not eager for facts, because it was in possession of general principles which explained the facts.

The third stage of knowledge Comte called the 'positive.' This deals with phenomena, grouping and arranging these. Comte's description of the progress of science is, I believe, now allowed to be faulty in its details, even by his most ardent admirers; but, on the other hand, those who are not his followers can scarcely deny the correctness with which he laid down certain main lines along which human knowledge has advanced, from the time when Socrates urged his disciples to give up empty speculations about the heavenly bodies for an observation of human phenomena, up to the present. The remarkable development of economic and social science in the United States, now attracting attention in Europe as well as in our own country, is due to a change of method and of purpose, both admirably illustrated in the present work on public debts. Professor Adams examines the facts of our economic history, and from them he draws conclusions respecting a sound financial policy for our Federal government, our States, and our municipalities. The older method would have been to search our history for facts to bolster up certain theories assumed before the book was begun. A change in purpose is as important as one in method. The change in purpose to which I allude is this: the tendency of modern economists is to renounce the position of mere advocates, — almost universally assumed by the older economists, — and to search for truth, like other scientific men, regardless of consequences. The old idea of the duty of an economist was that he must combat heresy, whereas heresy is something unknown to science. Clark's 'Philosophy of Wealth' and James's 'Relation of the Modern Municipality to the Gas-Supply,' both of which have been reviewed in *Science*, may be cited as other illustrations of the most recent tendencies in American economics.

The scope of this admirable work can be most readily gathered from the titles of the parts and chapters into which it is divided. Part I. treats of public borrowing as a financial policy; Part II., of national deficit financing; Part III., of local deficit financing. The opening chapter of Part I. first brings before the reader most vividly the facts in regard to the growth of public debts; and it is certain that few will read these pages without gaining a new idea of the tremendous significance of this factor in modern industrial life. Professor Adams opens his book with these words: "The civilized governments of the present day are resting under a burden of indebtedness computed at \$27,000,000,000. This sum, which does not include local obligations of any sort, constitutes a mortgage of \$722 upon each square mile of territory over which the burdened governments extend their jurisdiction, and shows a *per capita* indebtedness of \$23 upon their subjects. The total amount of na-

tional obligations is equal to seven times the annual revenue of the indebted States. At the liberal estimate of \$1.50 per day, the payment of accruing interest, computed at 5 per cent, would demand the continuous labor of three millions of men. Should the people of the United States contract to pay the principal of the world's debt, their engagement would call for the appropriation of a sum equal to the total gross product of their industry for three years; or, if annual profits alone were devoted to this purpose, they would be enslaved by their contract for the greater part of a generation." Chapters II. and III. treat of the political and social tendencies of public debts, and reveal the power of analysis which distinguishes Professor Adams in so high degree. I have particularly in mind those passages in which he shows, that, while public debts do not create class distinctions, they tend to render such distinctions perpetual. The analysis of the public debt of the United States is likewise specially interesting, for it reveals the surprising extent to which that species of property, at least, is concentrated. It appears that out of a total of \$664,000,000 registered bonds, \$410,000,000 are held in sums of \$50,000 and over. As Professor Adams pointedly remarks, this shows the absurdity of those who would have us keep our debt as an investment for widows and orphans. Chapter IV. deals with industrial effects of public borrowing, and Chapter V. answers the question, 'When may States borrow money?'

The topics of the chapters in Part II. are these: financial management of a war; classification of public debts; liquidation of war accounts; peace management of a public debt; payment of public debts.

Part III. opens with a comparison of local with national debts, and then passes on to an able account of State indebtedness between 1830 and 1850. Here, again, we see the difference between the economist as a man of science and the economist as the advocate of some powerful interest; for example, of corporations. The advocate will dwell on the evils of State enterprise when tried, and, passing lightly over those of private enterprise in the same field, will draw the conclusion that corporations can provide all things better than public bodies like cities, States, or the Federal government. Professor Adams, on the other hand, examines the entire field, conceals nothing, exposes unfortunate failures of public undertakings, and finds that in the Western States, whose history in this respect he has most carefully studied, "whether judged from the standpoints of results or of business probabilities, the State authorities showed greater foresight and greater business conservatism than individuals." While Professor Adams does not wish the States to undertake those kinds of business which are at all times subject to the control of competition, and suitable for private enterprise, he holds — and in this I fully agree with him — "that it was a mistake for the States to abdicate certain sovereign functions in favor of private corporations, for the evils thus incurred have proved greater than the evils escaped."

The remaining chapters of the book deal with municipal indebtedness and the policy of restricting governmental duties as a cure for public corruption and mismanagement. Going below the surface of things, Professor Adams finds in the improper restriction of governmental duties a chief source of bad government. It seems to me that this is beyond controversy when the facts are all reviewed. The whole history of industrial society tends to show that public duties can best be performed by public and responsible agents. It was a great step in advance when States ceased to sell their taxes to corporations and individuals, and to collect them themselves. Another step will be taken when public bodies assume the direct management of natural monopolies like gas-works, water-works, and railways. Are not these natural monopolies now a chief cause of disturbance and corruption? And how cure the disease without removing the cause, and how remove corporations from the field of natural monopolies unless governments absorb the duties they perform? In accordance with this view, Professor Adams very properly recommends the purchase of telegraph-lines by the Federal government as a solution of the difficulty which the treasury surplus occasions. We might then have as good a telegraph service as our present postal service.

It is also in accordance with this general view that Professor Adams recommends that treasury management be kept as free from bank agencies as possible. Our experience in the United

States seems to have demonstrated the wisdom of this. Before Senator Sherman became secretary of the treasury, it was customary to place Federal bonds on the market through the aid of syndicates of bankers, but he saved the United States over a million dollars in the sale of four-per-cent bonds by dealing directly with the public.

When I reviewed Professor Clark's 'Philosophy of Wealth' for *Science*, if my memory serves me correctly, I pronounced it one of the ablest works ever written by an American on the fundamental principles of political economy. I have elsewhere spoken of Professor Adams's monograph, 'The Relation of the State to Industrial Action,' as the profoundest study of the industrial functions of the State in the English language, going far ahead of any thing Mill ever wrote on that subject. I believe the present work on public debts the best work, on the topic with which it deals, to be found in any language.

In view of these facts, and others which might be cited, it does not seem rash to venture to predict that within ten years the recognized leaders of economic thought among English-speaking people will be Americans.

RICHARD T. ELY.

NOTES AND NEWS.

LETTERS have been received by the *Montreal Gazette* from Dr. G. M. Dawson, in charge of the Canadian geological party exploring the Yukon district, to date of July 29. The party constructed two boats on Dease Lake, and left on June 3 to descend the Dease River to its junction with the Liard. From that place Mr. McConnell left with two men to descend the Liard. The remainder of the party, with five Indians, ascended the north fork of the Liard to Lake Francis, and, leaving their boats, crossed a long portage of sixty miles to Pelly River, near the abandoned Hudson Bay post of Pelly Banks, where they arrived on the 29th of July, all well. From this place the Indians were sent back, and Dr. Dawson, with Mr. McEvoy and two white men, remained to construct a boat and descend the Pelly to its junction with the Yukon. The country north of Dease Lake proved somewhat varied in structure, having a granitic nucleus with paleozoic rocks on its flanks ranging from Cambrian to Carboniferous, and overlying Tertiary beds. The old portage was found to be entirely disused, and the party had to struggle through tangled woods, often knee-deep in moss. They got over, however, with a month's supply of provisions for the advancing party, and leaving stores cached for the returning Indians. Being north of the latitude of 60°, they enjoyed almost perpetual daylight, and the weather was good. The country is described as possessing well-grown trees, and a great number of the ordinary eastern plants were seen in flower, with some northern and western strangers. Only the great growth of sphagnum mosses and the abundance of reindeer moss give the country a different aspect from that of British Columbia. No Indians had been seen, except those the party brought with them from the coast. Though somewhat later in the season than he had expected to be, Dr. Dawson had still good hopes of reaching the coast before the freezing of the rivers, and the lines of section made by Mr. McConnell and himself will give a good idea of the structure or resources of the country.

— Since starting the third series of his 'Butterflies of North America,' Mr. Edwards has issued his parts in more rapid succession than before, a third number having appeared within the year. As it is the most important iconographic work now issuing in this country, and in artistic merit the peer of any that have yet illustrated the natural history of America, we may once more draw attention to it. Three species are illustrated, all from the Pacific coast, to each of which a quarto plate is devoted. Two of them, species of *Melitæa* and *Argynnis*, have liberal illustrations of the early stages, in which the points necessary to a good understanding of the structure of the caterpillar at different stages are especially well brought out. Considering that the insects had to be raised thousands of miles away from home, from material specially sought for, the success of Mr. Edwards is remarkable. The text in this part is almost entirely made up of technical details; and the third plate, another of the multitudinous species of *Argynnis*, is inferior in interest and in execution to the others, though the latter point would hardly be noticed were it not in a work of such uniform artistic excellence.