

able struggle and long debate to reawaken Liberals to the fact that Imperialism in itself is the eternal and deadly foe of all freedom, of all honest and responsible government, and of that very progress which had been forced upon it by the great reforms of the nineteenth century.

The author's chapters on "The Intellectual Reaction" and "Evolution and Sociology" deserve close attention. He brings out very clearly the fact that the political reaction (what he says here is equally true of this country and of all countries) is the expression of a far-reaching change in the temper of the time. Summed up in a word, he calls it a reaction against humanitarianism; but it has been curiously reinforced by an extraordinary misconception as to the bearing of the discoveries of modern science on political problems. Darwin's law of the "survival of the fittest" has borne fruit of which he never dreamed. It is used every day now, apparently with great success, as an argument in favor of the use of violence.

In the animal kingdom, superior breeds are produced by natural selection working through a fierce struggle for existence. Consequently, any race or nation which can overcome any other, take away its freedom, and appropriate its property, is the fittest to enjoy the fruits of the struggle, and selected by the laws of nature to do so. It is not to Darwin or Huxley that we owe this wonderful misapplication of scientific method; it is to the Imperialist and Jingo, who thought they found in the phrase "survival of the fittest" and "struggle for existence" a justification for wars of expansion. The author points out very neatly that you cannot argue from biology to politics. What is "fittest" to survive in biology is merely that which does as a matter of fact survive; what is fittest to survive in the world of conscious political and social effort is that which we decide it is desirable should survive. Biologically, the germ of consumption is admirably fitted to struggle for existence in and survive the consumptive patient. But we try to preserve the patient.

As to the great body of Liberal doctrine, the author is on firm ground. Liberal principles must involve opposition to a policy of protection, of war, of great armaments, of restriction of the press and public meetings; there has been no change in these respects since Cobden's, or indeed since Jefferson's, time. But the rock ahead for Liberals is Socialism. There is a widespread belief in Socialism in the newly enfranchised electorate, and the question of the day is whether Liberals can, by adopting Socialism in whole or in part, overcome the force of the Reaction, and again make Liberalism a dominating force in the government of the world. Here the author does not strike us as clear. He seems to be of opinion that some such development is possible, but his discussion is to a considerable extent beside the point. Socialism, or Collectivism, or Populism, is bound up with the idea that the machinery of government may be used for the purpose of effecting an equitable distribution of wealth. "Aggregations of wealth not acquired by labor service are," he says, "regarded by the Collectivist as a kind of surplus from which the funds necessary to meet public responsibilities should in the first instance be drawn." Now the belief of conservative Liberals, in fact of every Liberal who adheres to the fundamental

principles of political economy and individual freedom, is that this idea represents a monstrous delusion, and is, moreover, closely connected with the rankest paternalism. Without a system of espionage and confiscation for the like of which we should have to go back to the Rome of Nero, no inquiry into what wealth is acquired by "labor service," and no redistribution fit to "meet public responsibilities," is possible; and, if so, Liberals and Socialists will never long be found in the same boat. If this conservative economic view is correct, the Socialist is the real friend of the Imperialists, and has been such from the beginning of time.

Mr. Hobhouse gives a long array of radical measures which have been carried with the approval of Liberals—the Irish Land laws, the restriction of hours of labor, the municipalization of industries, factory inspection, etc.—and seems to infer from all this that, by adopting the rest of the Socialist programme, the Liberals may return to and develop new power. But if the old view is correct, the rest of the Socialist programme will mean the death of the Liberal principles which brought it about, and in the end an iron paternalism; at any rate, radicalism, or the use of the State machinery to cure specific evils by inspection, or revision and restriction of contracts, is no true Socialism, and to argue from Irish land reform to Collectivism is unpermissible. Here Mr. Hobhouse, we think, begs the question.

*The Phase Rule and its Application.* By Alex. Findlay. With an Introduction on the Study of Physical Chemistry, by Sir William Ramsay. Longmans, Green & Co. 1904.

There are numbers of highly successful men who have never been able to master elementary geometry or algebra. In the case of many of them, the defect is undoubtedly merely due to bad teaching. For others, there may be some peculiarity of metrical ideas which prevents these men from mastering them. But, with a third class, the truth probably is that there is a weakness of the understanding which causes all conceptions of the slightest intricacy to become confused. Now every man ought to endeavor to understand his own capacities; and the subject of the Phase Rule may serve as a touchstone to show him whether he belongs to the third class or not.

But what is this phase rule that has for so long set all the chemists agog? Take a number of materials, each either a pure chemical substance or a homogeneous mixture, but none of them such that any chemical reaction that could take place could produce it from the others, and (calling these the *components* of your system) put them into a tight cylinder in which a piston works, so that the aggregate can be subjected to varying pressure and temperature. Further, let there be some means of varying the proportions of the components present in the cylinder. Then, since the total quantity is a matter of indifference, there will be, as independently variable conditions, one for each of the components minus one, plus the pressure and the temperature; that is, on the whole, one more than the number of components. Now give your system time to come to a

settled state of equilibrium while there is no change of the above conditions. This equilibrium must be *stable*; that is, if you vary those conditions a little and restore them, the state of the system must be restored. Now count the number of *phases*, that is, the number of substances or homogeneous mixtures separated from one another by surfaces like the surface between water and air. Then it will be found that the degrees of freedom—that is, the number of conditions (pressure, temperature, and the proportions of components) that can be independently varied *without altering the number of phases or destroying the equilibrium*—are equal to two more than the number of components less the number of phases. For example, can water, ice, and aqueous vapor exist together? Here there is only one component, and we suppose three phases separated by surfaces. By the rule, the degrees of freedom amount to zero. That is, if the temperature and pressure are both fixed right, such a state of things is possible. But when it exists, neither pressure nor temperature can possibly be varied, the equilibrium being preserved, for the least change will cause either the vapor, the water, or the ice to pass away entirely. Suppose, however, that air be added, so that now there are two components, and, for phases, first, air mixed with a little vapor; second, water containing a little air in solution; third, pure ice. There will now, according to the rule, be one degree of freedom, and the pressure may be changed so long as the temperature is correspondingly changed. Suppose we let the ice melt. There will then be two components and two phases, and consequently by the rule two degrees of freedom. That is, both pressure and temperature may be varied, but only on condition that the proportions of water to air in the vapor and in the solution are correspondingly changed at the same time.

Such is the phase rule. Its mathematical form is identical with that of Euler's topological theorem that the combined number of faces and summits of any polyhedron is two more than the number of its edges; and, in topological geometry, the phase rule has nothing to do with *measurement*, but only with *counting* three sets of things—components, phases, and degrees of freedom. Nor do the experiments for verifying it require any measures to be made, but only that more and less should be discerned. Beyond that, there is no mathematics in the subject; but the chemical applications of the rule have a certain moderate degree of intricacy, not much less than that of elementary geometry and algebra. They will be beyond the powers of those who are unable to master those mathematical subjects owing to general weakness of the understanding, but will presumably (not certainly) be found to be just complicated enough to afford entertainment for other men.

The phase rule was discovered not by a chemist, but by Willard Gibbs, a mathematician, the ablest, in his particular line, of his day; the most unaffectedly modest man (for his strength) that search could find; the sort of man who is sure to be depreciated until, by the action of a sort of phase rule, the ice breaks up and men suddenly discover that it is best to laud him. For ten years and more the phase rule slumbered peacefully

In the Proceedings of the Connecticut Academy of Sciences until the chemists had grown up to it, till Roosevelt and others brushed the dust off the volumes and carried them into their laboratories. But Maxwell fully appreciated Gibbs long before the phase rule was discovered.

Dr. Findlay's illustrations from chemistry are as replete with interest as they are abundant, and each one detailed. Upon all that side the work is simply splendid. Its weakness is that the abstract definitions, and the possibilities which the phase rule leaves open, but which have not yet been met with in nature, are not forced upon the reader's attention in all their definiteness sufficiently to enable him to comprehend exactly what the phase rule does for him in each case. In short, the work presents a picture admirably rich in its coloring, but whose outlines are too soft for a scientific purpose—on rare occasions, quite indefinite or even wavering. The practicable remedy for this in a new edition would be an appendix to which the reader could always turn to find there the abstract parts of the subject defined with abstract precision. The reviewer must confess that, though the subject is not new to him, he has here and there in the perusal of the work found his ideas losing their definiteness; and this state of things was not remedied until he had drawn up for himself the sort of appendix that was needed. However, taking the book as it is, anybody who adds to a turn for the mode of thought a fondness for chemistry, will find the volume replete with matters of singular interest.

Sir William Ramsay's introduction contains a very good sketch of the history of physical chemistry without any such high merit as one would have expected. The language is that of a man who, when he thinks, imagines apparatus and experiments, and who has little training in the use of words. Thus, on page lxi, he finds fault with Julius Thomsen because, in 1854, he believed it possible to measure the force of chemical affinity by measuring the heat evolved in reactions; and his objection is simply that heat is not force, but energy, a quantity of different dimensionality. Now this is hypercritical in the extreme; for though the word *energy* had been proposed by Young, it was not at all in use, even in England, before Rankine's paper of 1853, and in Denmark was quite unheard of; the word "force" being much more loosely used than it now is.

*The Lure of the Labrador Wild: The Story of the Exploring Expedition conducted by Leonidas Hubbard, Jr. By Dillon Wallace.* F. H. Revell Co. 1905. 8vo, pp. 339, illus, and maps.

Leonidas Hubbard, a Michigan farmer's son, became a newspaper reporter and later an editor of a magazine devoted to out-of-door life, at the age of twenty-nine had the ambition to explore unknown regions. Though obviously no expert woodcraftsman, he had made journeys in the Hudson Bay region and in southern Labrador. The project he finally decided on was to start from the Northwest River post of the Hudson Bay Company, ascend this stream to Lake Michikamau, the largest lake in eastern Labrador, where the Nascaupé Indians were said to meet in September the

herds of caribou migrating from the interior to the coast, killing great numbers. Hubbard wished not only to report the features of the annual battue, but also to spend some time studying the very primitive natives, who are little known. From the northern end of the lake he then proposed to work across the country to the George River, which falls into Ungava Bay. The route he proposed to take was practically unexplored by white men, and the country was well known to afford comparatively little fish or game for sustenance, and to be terribly infested by black-flies and mosquitoes.

For the journey the services of George Elson, a half-breed Cree Indian from James Bay, were engaged, and the leader associated with himself his friend the author of this volume. Elson proved to be an excellent woodsman, faithful, able, and indefatigable, and to him the survivor of the party undoubtedly owes his life; but, like others of his kind, he was diffident in insisting on his own better judgment in cases where the leader of the party, though less competent, seemed to favor other counsels.

The party in the main was well supplied with stores and an excellent canvas canoe, though some necessities, like extra footgear, a gill net, and shotgun, were omitted, with disastrous results as the event proved. After various trying delays, the party arrived at the Northwest River post, and naturally found it difficult to get reliable geographical information about an unexplored district. On July 15, 1903, the party started from the post for the mouth of Nascaupé River, one of several streams emptying into the upper end of Hamilton Inlet, but neglected the precaution of taking a guide, passed the entrance without seeing it, and started up a smaller river, the Susan, which flows in the same general direction. This river soon gave out, and the party continued to make portages, struggling through the swamps, tormented by pestiferous insects, their single pairs of moccasins and much of their clothing reduced to rags, and their food rapidly dwindling. They had unusual luck in fishing, and made good use of their rifles and pistols, so that it was possible to continue in the direction of their goal until, from the top of a high peak, the waters of Michikamau were actually discerned by Hubbard, across miles of woodland—alas, too late!

Nearly out of food, it seemed impossible to go on, and the fact that the leader's health gave out, in spite of his marvellous courage and energy, settled the matter. They were obliged to return over the dreary road by which they had come, and even then might all have pulled through alive had it not been for a fatal error of judgment on Hubbard's part in electing, against the deferential advice of his companions, to leave a navigable stream, the Beaver, which they had reached, for the vastly more difficult route by which they originally came. After that the record is one of slow starvation and misery. With the advent of cold weather the fish ceased to bite, and the party had no net; their feet were bare, and they had no footgear. Struggle as they might, in spite of really heroic endurance, Hubbard at last gave out, on October 18, and was made as comfortable as possible in a tent, while his companions pushed on in search of food and help. A

little further, Wallace, too, succumbed to the inevitable, and all hope depended upon Elson, who pushed on courageously and finally reached help. Kindly settlers found Wallace in time to save his life, but Hubbard's note-book showed that he had perished probably within twenty-four hours of the departure of his companions. Wallace's convalescence from starvation and frost-bite was slow, pathetically aided by, if not wholly due to, the ministrations of a young medical man, himself dying of consumption. Finally, the remains of the leader were rescued, and the journey toward home carried out against great difficulties, by the devotion of Wallace and the kindly aid of the Labrador people.

It would be wrong to obscure the fact that the sufferings so well borne and the death so bravely met were largely due to insufficient knowledge both of how to conduct such an expedition and of his physical fitness for it on the part of the leader. But which of our failures and sufferings in this vale of tears may not be ascribed to analogous ignorance or weakness? It is certain that all three of the party met their calamities like men—as we love to say, however boastfully, like good Americans; and the lesson of their travail is twofold: first, know what is to be done and how to do it, if you would explore the wild; second, if misfortune comes upon you, face it without fear and with a manly heart, leaving the outcome with confidence to a higher power. In the second of these matters Hubbard and his comrades did not fail, and that is surely no meagre praise.

*The Shu King, or, The Chinese Historical Classic: Being an Authentic Record of the Religion, Philosophy, Customs, and Government of the Chinese from the Earliest Times. Translated from the Ancient Text, with a Commentary, by Walter Gorn Old, M.R.A.S. 12mo. John Lane. 1904.*

If a man sets to work to publish a book like this one, the preparation of which must cost him a good deal of time and labor, the first thing he has to do is to find out what work has been done before him in the same line. To all who intend to take in hand Chinese research of any kind or the compilation of books and papers on China, let it be said that there is no better method of being posted on this point than to glance at that excellent guide, Prof. Henri Cordier's *Bibliotheca Sinica, Dictionnaire Bibliographique des Ouvrages relatifs à l'Empire Chinois*, the first edition of which, with its supplement (Paris: Leroux, 1881-1895), acquaints intending writers with every important book or paper published on Chinese and Central Asiatic subjects under the several classified heads. A new edition of this most useful work is just forthcoming (Paris: E. Guilmoto). The titles of papers and books which have appeared since the close of Cordier's bibliography, can be ascertained from Prof. Lucien Scherman's *Orientalische Bibliographie*, published periodically (Berlin: Reuther & Reichard) in three or four instalments per annum. By referring to these indispensable helps, an author cannot easily fall into the trap in which the author of the above work was caught by neglecting to make inquiries about the existing literature before setting to work.

A book like the *Shu King*, the oldest

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