

diplomacy was quite as ready with the suggestion that England tell Russia to keep her hands off, to let the little pyromaniac be duly punished by Germany's friend.

In all this, neither German nor British diplomacy would recognize the fact. Each deceived the other, but in what was vital both deceived themselves. French diplomacy, on the contrary, neither deceived nor was deceived. At the proper moment France and Russia assured each other and the world of their solidarity. The French ambassador at Rome obtained the all-vital assurance from the Marquis di San Giuliano that Italy would stay out of the war. The French ambassador at London laid before Sir Edward Grey the statement of views, not a declaration of purpose, be it understood, that France and England had exchanged long before, covering the existing situation.

It was of utmost importance both for France and for Germany to know what Great Britain would do, and it was plain all through the critical week that Great Britain herself did not officially have the remotest idea of what she would do. Yet up to the very last moment Germany was satisfied that England would stay out, and France never, during all the anxious hours, seemed to have the smallest fear that her neighbor across the Channel would prove disloyal. French diplomacy was right. It was informed about this as about all other things. It recognized that there was in London, as in Berlin, a state of mind.

The truth of course is that there never was the smallest doubt that England would join in a general war if Germany attacked France, or in any way, save under direct provocation, went to war with the republic. Most well-informed Englishmen knew it, had known it without acknowledging it, for ten years. The German realizes this now and rages because his own state of mind is being generally exploited and the British state of mind disguised, concealed behind details and circumstances he realizes are incidental and fortuitous.

No one has described this British state of mind so well as Shaw. But what is useful to note now is that the French understood it. Their allies, the Russians, saw it through their eyes and understood it. France and Russia acted steadily with this knowledge. Germany misunderstood it. German diplomacy failed to grasp the fact, wholly misunderstood Sir Edward Grey's activity. Hence that panic of Berlin when England at last acted on her state of mind. Hence the present hatred of England, a hatred based on the fact that Germany misunderstood England's mind and believed that England misunderstood her own interests, the most impossible of all contingencies.

Thanks to the Yellow Book we now perceive that French diplomacy and statesmanship misunderstood neither the British nor the German state of mind. Knowing the British state of mind, France knew that England was bound to fight Ger-

tiently shared in all the efforts of Sir Edward Grey. Knowing the German state of mind, she was aware of the certainty of the failure, but that Germany might have no second Ems warrant for war, she observed every diplomatic convention with almost pathetic fidelity.

In July the Germans believed what they did not know, because it was pleasant; the British refused to believe what they knew, because it was unpleasant. But French diplomacy from the very start recognized the fact, terrible as it was for France. That is why now, when Briton and German are filling the world with their explanations, the Frenchman has nothing to explain. Being a Latin, what he had long foreseen did not surprise him.

FRANK H. SIMONDS.

International Rivalry in Science

A COMPARATIVE estimate of the scientific work accomplished in the several countries involved has loomed prominently since the beginning of the war. Unfortunately the literary men who have been most active in the appraisal know little of science, and the scientists themselves have on the whole been far from dispassionate. Very few are able, like Haeckel, to combine high veneration for alien cultures with a fervent patriotism; and fewer still are those who, like Bertrand Russell, the philosopher, and Max Verworn, the physiologist, rise above the limitations of nationalistic sentiment. Sir William Ramsay, in a recent issue of *Nature* (October 8, 1914) seeks to belittle German science and proclaims to a willing public the far from original discovery that the Germans are adapters and plodders but lack originality. When a first-rate chemist indulges in this sort of talk, absolutism must be granted to yellow journalists.

We may at once dismiss the notion that any one of the West European peoples is racially better fitted than the rest for scientific work, whether creative or not, as a piece of anthropological nonsense. First of all, the national limits do not coincide with the racial boundaries. Secondly, if they did, all the "races" concerned would still be so closely allied from a biological point of view that a far-reaching difference in intellectual endowment is simply out of the question. The only problem that can be discussed with any satisfaction is whether in some countries the historical development has created conditions that are more favorable to the highest grade of scientific work. And if we face this problem at all impartially, the international character of science stands out clearly.

Take three of the greatest scientific generalizations, the law of gravitation, the principle of the conservation of energy, and the the

law for planetary motions; Galileo, the Italian, had discovered the law for the velocity of a falling body; and Huygens, a Dutchman, independently solved the problem of several bodies affecting one another's motions. German and English scientists—Helmholtz, Mayer, Joule, Kelvin—share the honor of establishing the principle that energy can be transformed but never destroyed; but according to an impartial German historian of physics, Professor Ernst Mach, the crowning glory of the achievement belongs to a French predecessor of all of them, Sadi Carnot. Evolution is popularly associated with the name of Darwin; but Darwin had for his precursor the Frenchman Lamarck, for his most ardent follower the German Haeckel. The problem of heredity was first seriously broached by the German Weismann, Mendelian inheritance was the discovery of an Austrian monk, and evolution by leaps rather than by gradual variation was postulated by the Dutch botanist De Vries.

The three generalizations have been chosen more or less at random; we may be confident that, except from accidental causes, other fields of research would yield the same result. Unfortunately the whole subject is clouded for the lay mind—and alas, for the specialist often enough—by the deep impression received from the popular reputation of scientists. To many it will seem that among the names mentioned those of Newton and Darwin easily lead the rest. But popular reputation is a remarkably unsafe guide to scientific worth. How many educated men in the United States know that European judgment places the late Willard Gibbs above all other American scientists? The real contribution made even by the greatest thinker as compared with his predecessors and compeers is a problem that requires the most intensive historical study, and even then, often enough, the doctors disagree. In the whole range of science no name is so universally honored as that of Newton, but he must not be conceived as a giant walking among pygmies. Mach thinks that in mechanics the intellectual achievement of Newton had been fully prepared by Kepler, Galileo, and Huygens, and that its distinguishing trait was power of imagination. But, on the basis of careful documentary research, the most recent student of the subject, Mr. Philip E. B. Jourdain of Cambridge, England, denies that Newton owes his unique place to any unusual feat of the imagination, attributing it rather to his mathematical insight. When we turn to the history of Newton's mathematical discoveries, we find a rival in the person of Leibnitz. The story that the great German plagiarized his English contemporary is an exploded myth. Among those who dispelled the charge may be mentioned the English mathematician De Morgan, who showed that Leibnitz was honest and ingenuous, and that in the course of incidental incursions into mathematics he had "produced one of the greatest of its inventions almost simultaneously with Newton." Popular fame in

What can be established by historical research for the case of Newton, the supreme intellect of science, requires no particular research in the case of Darwin. His influence on thought has been enormous, and the lay mind jumps to the inference that such influence could only have been achieved by a supreme mind. But what are the facts? Huxley, who knew Darwin, loved him, fought for him, and was probably the all-round best judge of Darwin's ability, would have nothing to do with the colossal-intellect myth. He granted to Darwin a clear, rapid intelligence, a great memory, and a vivid imagination; he would not place him above Lamarck or Johannes Müller or Karl Ernst von Baer.

The history of science, as popularly conceived, is shot through with Carlylean hero-worshipping myths. In reality there are great outstanding figures, but no Brobdignagians. Even granting that it were possible to indicate in every field the supreme name, no one would be able to decide satisfactorily whether such supremacy were or were not outweighed by the cumulative influence of two or three somewhat lesser reputations representing some other nationality.

In the place of this futile estimate rises the conception of science as a cooperative undertaking of numerous trained workers: instead of Carlylean heroes, Carlylean "able men." From this point of view a genius who in ignorance of history should unwittingly duplicate Newton's discoveries, would acquire only the social value of a tight-rope walker or a heavy-weight lifter. Comparison of national achievement in science thus ceases to be a fruitless bickering over the relative merits of a few great men whose value is usually incommensurate. Instead we are confronted with the problem as to which country has most effectively organized scientific effort. And here there can be but one answer, even on the hostile side: Germany. All that has been said against German scientific work is but a ruse to offset the glaring fact of the supremacy of its total output. The alleged mediocrity of many German scholars need not even be discussed. Where there are more workers there will be of necessity more men of merely average endowment. The amazing thing is that these mediocre men do work that is above the average, owing to the very machine that itself teaches being original, even in a small way. Again it is said that organization stifles personality. No more manifest psychological falsehood has been uttered. The mathematician is not hindered in the development of his work by the use of tables and calculating-machines. The perfect systematization of all intellectual work is thus not only no hindrance to individual development, it is the prerequisite to full and free development of personality. It enables the genius, no less than the able man, to realize his very highest possibilities. From a social point of view its value is immeasurable. Clear, rapid intelligence for a lever, system for an Archimedean standing-ground, will suffice to

War and Thinking

ONE of the first effects of the war was to reassure everyone who confidently specializes in human affairs that his particular enthusiasm was justified. The pacifists flattered themselves that they had at last a cogent and unmistakable demonstration of the rottenness of the *para bellum* argument, the "ghastly swindle," as Mr. Creel calls it. On the other hand, Mr. Roosevelt and the *para bellumists* assume that their contention is now proved beyond cavil. Both suffragists and anti-suffragists are confirmed in their conflicting faiths by the same disaster. Cardinal Farley sees a long-suffering God punishing the nations for their blasphemies, and Pastor Russel reports progress in the unfolding of "the divine plan." Does this mean that the opinions and inferences of all these earnest people are worthless, or does it mean rather that each has used the great conflagration to warm up his own particular *pot-au-feu*? To the outsider this would imply a rather narrowly domestic attitude of mind.

The general emotion which has controlled and determined thought about the war is of course national prejudice. We were all prepared for that, and it has brought only one surprise. Englishmen and Americans and the few Frenchmen whose utterances have reached us have exhibited about the range and intensity of sentiment that might have been anticipated; the Germans, on the other hand, we have found difficult to understand. We looked forward to some variety and conflict of opinion among them, to at least a mild protest against the war on the part of the socialist leaders, or the expression of a reservation now and then as to the emperor and the army in the letter of some learned professor to an American friend. But a fierce outburst of national feeling has driven reason into hiding and left the field to arrogance, hate and suspicion.

The propositions upon which Germans of all classes appear to agree are the following. The German people are inherently a superior race who have developed a civilization (*Kultur*) of unprecedented perfection, of which their military organization, with its marvelous discipline and applications of modern science, is the essential safeguard against the jealousy of decadent nations, like France and England, and the barbarism of the Slavs. Germany is now meeting the attack which she has long anticipated, under the natural leadership of her emperor; her occupation of Belgium was amply justified by the straits in which she found herself through no fault of her own. These propositions, in spite of their very startling nature, are assumed rather than defended, and Germany's apologists seem surprised and deeply pained that we in the United States do

only be explained by the assumption that we are enmeshed in the lies of Germany's enemies or bought with British gold.

We, on the other hand, are only too conscious that no British gold is flowing our way, and we feel not only that the Germans have had an opportunity to tell us all that they have to say about themselves, but that they have freely availed themselves of the opportunity. Germany's most noted men have set forth her case jointly and severally, and her agents and friends on this side of the water have given us the very "truth about Germany" and made clear the "vital issue." As for the case of the Allies, we have heard very little from Russia; France has held her peace; Belgium has satisfied herself with a dignified appeal or two, and even our cousins across the Atlantic have manufactured but little opinion for export. At first we thought we had a very simple explanation of the war and of the attack on Belgium; we said that the great mass of the German people had been misled by the Kaiser and the war party. Then we waited patiently for some German to say this, and we even went so far as to suggest this means of exonerating the nation.

But no German welcomed our well-intentioned suggestion; on the contrary, all Germans bitterly resented the notion that the Kaiser and the army were not the divinely appointed means of saving the nation from destruction. Eucken and Haeckel took the lead in showing us our mistake. Never before in all their lives had they agreed on a single thing, but when it came to defending the war and Germany's part in it they laid aside all philosophic differences and joined in a strident duo of invectives against "perfidious Albion." Romain Rolland, laboring under the same delusion as we, wrote a high-minded letter of appeal to his friend, Gerhardt Hauptmann, only to receive a scathing rebuff. When English clergymen tried to explain to Harnack how he ought to feel, the eminent church historian told them to mind their own business, that Germany was not an *energumen*, possessed of a devil to be exorcised by English prayers.

Only gradually are we coming to see that we have not reckoned with certain national presumptions of the gravest import for the world, which are so effectively inwrought through education into the fibre of German life that even those whose intellectual experience has been wide and varied—men like Eduard Meyer, Brentano, Sudermann and Wilamowitz—accept them unquestioningly. Just at a time when all the older notions of race are being undermined by anthropologists, historians and biologists, the Germans would have us accord them a position of racial supremacy; just when the world is becoming unified economically and scientifically, the