

Chaim Weizmann

In 1914 Chaim Weizmann, a Russian-born Jewish biochemist, invented a fermentation process to produce acetone...

"So it came about," writes Weizmann, "that one day in March [1915], I returned from a visit to Paris to find waiting for me a summons to the British Admiralty." The Admiralty, of which Winston Churchill, at forty-one exactly Weizmann's age, was First Lord, faced a severe shortage of acetone. That acrid solvent was a crucial ingredient in the manufacture of cordite, a propellant used in heavy artillery, including naval guns, that takes its name from the cordlike form in which it is usually extruded. The explosive material that hurled the heavy shells of the British Navy's big guns from ship to ship and ship to shore across miles of intervening water was a mixture of 64 parts nitrocellulose and 30.2 parts nitroglycerin stabilized with 5 parts petroleum jelly and softened—gelatinized—with 0.8 percent acetone. Cordite could not be manufactured without acetone, and without cordite the guns would need to be extensively rebuilt to accommodate hotter propellants that would otherwise quickly erode their barrels.

Weizmann agreed to see what he could do. Shortly he was brought into the presence of the First Lord. As Weizmann remembered the experience of meeting the "brisk, fascinating, charming and energetic" Winston Churchill:

Almost his first words were: "Well, Dr. Weizmann, we need thirty thousand tons of acetone. Can you make it?" I was so terrified by this lordly request that I almost turned tail. I answered: "So far I have succeeded in making a few hundred cubic centimeters of acetone at a time by the fermentation process. I do my work in a laboratory. I am not a technician, I am only a research chemist. But, if I were somehow able to produce a ton of acetone, I would be able to multiply that by any factor you chose." . . . I was given carte blanche by Mr. Churchill and the department, and I took upon myself a task which was to tax all my energies for the next two years.

That was part one of Weizmann's acetone experience. Part two came in early June. The British War Cabinet had been shuffled in May because of the enlarging disaster of the Dardanelles campaign at Gallipoli; Herbert Asquith, the Prime Minister, had required Churchill's resignation as First Lord of the Admiralty and replaced him with Arthur Balfour; Lloyd George had moved from Chancellor of the Exchequer to Minister of Munitions. Lloyd George thus immediately inherited the acetone problem in the wider context of Army as well as Navy needs. Scott of the *Manchester Guardian* alerted him to Weizmann's work and the two men met on June 7. Weizmann told him what he had told Churchill previously. Lloyd George was impressed and gave him larger carte blanche to scale up his fermentation process.

In six months of experiments at the Nicholson gin factory in Bow, Weizmann achieved half-ton scale. The process proved efficient. It fermented 37 tons of solvents—about 11 tons of acetone—from 100 tons of grain. Weizmann began training industrial chemists while the government took over six English, Scottish and Irish distilleries to accommodate them. A shortage of American corn—German submarines strangled British ship-

ping in the First War as in the Second—threatened to shut down the operations. “Horse-chestnuts were plentiful,” notes Lloyd George in his *War Memoirs*, “and a national collection of them was organised for the purpose of using their starch content as a substitute for maize.” Eventually acetone production was shifted to Canada and the United States and back to corn.

“When our difficulties were solved through Dr. Weizmann’s genius,” continues Lloyd George, “I said to him: ‘You have rendered great service to the State, and I should like to ask the Prime Minister to recommend you to His Majesty for some honour.’ He said, ‘There is nothing I want for myself.’ ‘But is there nothing we can do as a recognition of your valuable assistance to the country?’ I asked. He replied: ‘Yes, I would like you to do something for my people.’ . . . That was the fount and origin of the famous declaration about the National Home for Jews in Palestine.”

The “famous declaration” came to be called the Balfour Declaration, a commitment by the British government in the form of a letter from Arthur Balfour to Baron Edmond de Rothschild to “view with favour the establishment in Palestine of a national home for the Jewish people” and to “use their best endeavours to facilitate the achievement of this object.” That document originated far more complexly than in simple payment for Weizmann’s biochemical services. Other spokesmen and statesmen were at work as well and Weizmann’s two thousand interviews need to be counted in. Smuts identified the relationship long after the war when he said that Weizmann’s “outstanding war work as a scientist had made him known and famous in high Allied circles, and his voice carried so much the greater weight in pleading for the Jewish National Home.”

But despite these necessary qualifications, Lloyd George’s version of the story deserves better than the condescension historians usually accord it. A letter of one hundred eighteen words signed by the Foreign Secretary committing His Majesty’s government to a Jewish homeland in Palestine at some indefinite future time, “it being clearly understood that nothing shall be done which may prejudice the civil and religious rights of existing non-Jewish communities in Palestine,” can hardly be counted an unseemly reward for saving the guns of the British Army and Navy from premature senility. Chaim Weizmann’s experience was an early and instructive example of the power of science in time of war. Government took note. So did science.