

were not completely offset by the employment of foreigners.

The increase, from September 1939 to September 1944, in the number of German men and women employed (including the armed forces) was less than one million, and it fell short of the natural growth of the working age population over the period. The armed forces mobilized 11-1/2 million men from the outbreak of the war up to September 1944; and their place in the civilian labor force was but partially filled by 7 million foreign workers and prisoners of war and the 1 million newly mobilized Germans, resulting in a net loss of 3-1/2 million (10 percent) to the civilian labor force.

This decline in civilian manpower is the more remarkable, because Germany did not exhaust her reserves of manpower in the course of the war. She began the war with about the same proportion of occupied women (outside agriculture) as Britain. But while in Britain the number of women in full or part-time work increased 45 percent in the course of the war, the number of German women mobilized remained practically unchanged. In Britain, the number of domestic servants was cut from 1.2 to 0.5 millions in the course of the war; in Germany it fell only from 1.5 million to 1.3 million. There were also other sectors of the economy that had large reserves of labor which could have been utilized for war work. Among them were the public administration system employing some 3.5 million workers, which Speer attempted unsuccessfully to reduce; and civilian industry which had a considerable cushion until the last stages of the war.

It is possible that the Germans considered the further mobilization of labor impolitic and psychologically undesirable; on the other hand, such considerations would hardly have stood in their way after the defeats in Russia, had manpower been the real obstacle to the expanding of armament production. The policy adopted at the time secured the additional resources needed for increasing current armament production by halting the expansion of basic industries - an expansion which in any case would not have borne fruit soon enough to contribute to the war effort. This policy limited industrial manpower requirements to an extent where they could be fully satisfied by measures which fell short of total mobilization. These measures included, in addition to the draft of foreign workers, the lengthening of the working week in certain critical industries, the shifting of workers from non-essential sectors of the economy, and the increasing of

labor productivity through rationalization measures.

There is no doubt that manpower for the armed forces was short, in the sense that after the Russian defeats, Germany would have liked to put a larger army in the field. Even here, however, there remained some reserve which could have been mobilized for the Wehrmacht. Several of Germany's leaders argued that at least half a million of the men deferred for occupational reasons could have been replaced. These critics also argued that the ratio of combat troops to total troops was very low and that only tradition prevented it from being increased. That the Germans did not take more extreme measures to increase the size of their armies may be due to the overconfidence of the German war leaders, which was fostered in the early war years and given up only after the initial defeats in Russia. Or, it may also be due to the fact that the Germans, having begun an energetic munitions production program only in 1942, could not increase their armament output at a fast enough rate to arm more divisions.

RAW MATERIALS

Germany's dependence on imported raw materials was always regarded as the main weakness of her war potential. The Four Year Plan of 1936 which was designed to mitigate this weakness, secured her a certain degree of independence in critical war materials - chiefly through the synthetic production of rubber, oil, textile fibers and fats, the development of domestic iron ores in central Germany and through increasing the capacity of aluminum and magnesium production. These steps, however, did not render Germany self-sufficient - not even in the limited field of materials that could be synthetically produced. At the outbreak of the war, Germany still depended on foreign sources for 70 percent of her iron ore, 90 percent of her copper, and for all of her manganese, chrome, nickel, wolfram, tungsten and a host of other raw materials. Apart from nitrogen and coal, in no war material of importance could German production cover peacetime consumption, still less any additional requirements of war.

Germany managed, however, at least until late in 1944, to avoid any serious embarrassment to her war effort from the shortage of imported materials. When the war started, stocks of copper, iron ore, lead and magnesium were adequate for less than nine months' consumption and only in the case of

manganese was there a supply sufficient for 18 months. In the case of copper and ferroalloys, the Germans found that consumption could be drastically cut without real detriment to the quality of armaments; and they were able to reclaim considerable stocks from scrap. The annual consumption of copper, wolfram, molybdenum, and cobalt was reduced by more than one-half. The victories of 1939 and 1940-41 led to the capture of considerable stocks of these materials and also to new sources of current supply, such as chromium from Bulgaria and Greece, nickel and molybdenum from Finland and Norway, copper from Yugoslavia, Norway and Finland, manganese from Russia, mercury from Italy and Spain, and bauxite from Hungary, France, Yugoslavia and Italy.

Synthetic capacity for rubber and oil was increased during the war, or at least until 1944, when it was reduced by bombing. Synthetic rubber production was raised from 5,000 tons in 1938 to an annual rate of 117,000 tons by the beginning of 1944. Synthetic oil production was raised from 1.6 million tons in 1938, to an annual rate of 6 million tons by early 1944, and crude oil production was expanded from 0.6 million tons to 2 million tons. Together with the Rumanian and Hungarian imports of about 2.5 million tons, oil supplies were considered adequate for the type of strategy adopted. It is to be noted, however, that this strategy was itself adjusted to the oil supply. Means of warfare involving heavy oil consumption - such as a fully motorized army or a large force of heavy bombers - were and perhaps had to be foregone.

The supplies of normally home-produced materials, such as steel and coal were likewise adequate or more than adequate for the armament program, at any rate up to the middle of 1944. Steel allocation formed the basis for all production plans from the beginning of the war; and in the period 1939-40, it was the scarcity of steel which Germans believed to be the limiting factor on the scale of their armament program. But, as it subsequently turned out, military steel requirements were grossly overestimated by the Wehrmacht. Allocations were far too generous in relation to production schedules and considerable quantities of steel were diverted to non-military uses and stocks. Even with these excessive allocations only 0.9 million tons of steel, half the total monthly supply, was appropriated for the direct armaments program. With the occupation of the western countries in 1940, Germany's