ONE

A Brief History of Occupational Health Psychology

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Summary

"To love and to work" was Sigmund Freud's curt response when asked what a "normal person should be able to do well" (Erikson, 1963, pp. 264–265). This book is not about erotic love, the love to which Freud referred. Rather, the book is about the psychosocial aspects of work and how they bear on mental and physical health. Extensive research supports the view that the impact of working in a psychologically unrewarding job extends beyond work hours, and affects the individual's life situation and health (Gardell, 1976).

According to the Centers for Disease Control and Prevention (CDC, n.d.), occupational health psychology (OHP) involves "the application of psychology to improving the quality of work life, and to protecting and promoting the safety, health and well-being of workers." OHP is an interdisciplinary subfield of psychology that aims to improve our understanding of the impact of psychosocial working conditions on the health and well-being of people who work. This understanding can help us design interventions that make working conditions more healthful *and* economically productive (LaMontagne, Keegel, Louie, Ostry, & Landsbergis, 2007). An example of a psychosocial workplace characteristic that OHP researchers have investigated is the extent to which an organization affords workers autonomy in the performance of their jobs. OHP is interdisciplinary in that it borrows strength from such fields as industrial/organizational psychology, health psychology, occupational medicine, and epidemiology.

OHP is devoted to understanding the relation of work characteristics to *both* the psychological and the physical well-being of people who work. With regard to psychological effects, OHP research is concerned with the extent to which workplace characteristics affect depression, burnout, suicide, and psychological distress. Researchers also examine the impact of work characteristics on blood pressure, heart disease, musculoskeletal disorders, and accidents and injury. The OHP research umbrella extends even further, and includes the effects of job conditions on home life.

OHP research is concerned with what workers bring to their jobs. Investigators try to identify workers' coping responses that either fully or partly prevent job stressors from occurring or that mitigate the impact of stressors. Some coping responses are behavioral (e.g., a teacher taking direct action by initiating contact with the parent of a disrespectful student) and others, cognitive (e.g., mentally comparing oneself with a colleague who "has it worse than me"). In addition, OHP is concerned with how the psychological characteristics of a worker (e.g., preexisting psychological distress) pave the way for job stressors to occur.

The next section of this chapter examines the historical antecedents of OHP as well as its institutional history. The origins of such OHP-related themes that are developed later in the book, themes such as worker autonomy and support, and even the impact of combat on soldiers—people who work for the military—date well before OHP emerged as a recognizable subfield of psychology. This historical survey begins in the 19th century. The chapter works its way through the 20th century and into

the 21st. In addition, it examines a few landmark studies as well as the development of important organizations that support OHP.

EARLY FORERUNNERS

Some of the readers of this book may remember the 1981 film *Chariots of Fire*. The film concerned the intense preparations of two British sprinters, Harold Abrahams and Eric Liddell, for the 1924 Olympic Games. The title of the film came from a poem written by the great English poet and visual artist William Blake (1808/1966), and was taken from the following stanza:

> Bring me my Bow of burning gold;
> Bring me my Arrows of desire:
> Bring me my Spear: O clouds unfold!
> Bring me my Chariot of fire!

It is a short poem known by its first line, "And did those feet in ancient time." The poem contemplated Jesus coming to England to create a heaven in that "green and pleasant land." Jesus, however, encounters the physical and spiritual destructiveness of the burgeoning Industrial Revolution. An earlier stanza reads:

> And did the Countenance Divine,
> Shine forth upon our clouded hills?
> And was Jerusalem builded here,
> Among these dark Satanic Mills?

Blake's poem reflected on the damage the Industrial Revolution caused not only to the physical landscape but also to the spiritual lives of its inhabitants. The poem reminds us of the harm rapid industrialization can do to human beings, their interpersonal relationships, and their relationship with their work. Karl Polanyi (2001/1944) noted that "writers of all views and parties, conservatives and liberals, capitalists and socialists, invariably referred to social conditions under the Industrial Revolution as a veritable abyss of human degradation" (p. 41).

Engels and Marx

In 1845, Friedrich Engels published *The Condition of the Working Class in England*. It is of note that this man who was so sympathetic to the working class was the son of a Prussian textile manufacturer. In 1842, his parents sent him to Manchester to work at one of his father's mills in the hope of spurring the young man to relinquish the pro–working-class sentiments he had already developed. His sojourn to England, however, further fueled his interest in the working class, and led to the research he conducted for the book on the English working class.

Engels wrote about how large and centralizing manufacturing was driving small traders and craftsmen out of business and creating a large industrial proletariat. He underlined the high rates of death from disease in industrial centers. He wrote:

> That a class which lives under the conditions already sketched and is so ill-provided with the most necessary means of subsistence, cannot be healthy

and can reach no advanced age, is self-evident. Let us review the circumstances once more with especial reference to the health of the workers. The centralisation of population in great cities exercises of itself an unfavourable influence; the atmosphere of London can never be so pure, so rich in oxygen, as the air of the country; two and a half million pairs of lungs, two hundred and fifty thousand fires, crowded upon an area three to four miles square, consume an enormous amount of oxygen, which is replaced with difficulty, because the method of building cities in itself impedes ventilation.

The 19th century saw the beginning of a growing concern for the impact of industrialization on the physical well-being of workers. The century also marked a growing concern for the link between industrial capitalism and workers' psychological well-being. In response to the Industrial Revolution, Karl Marx (1967/1844) developed the multilayered concept of alienation, a concept that had significant psychological meaning. In one sense, alienation refers to workers losing, with the rise of industrial capitalism, the ability to direct their own lives. Alienation reflects the individual's loss of conscious control over his or her creative labor. In another sense, alienation refers to the worker's estrangement from other workers as a result of the commodification of work. Workers become mere interchangeable, salable parts in a giant industrial flywheel. In another sense, alienation refers to industrial workers, in return for a wage, becoming distanced from what they create. During the Industrial Revolution, production lines reduced work to highly repetitive, monotonous tasks that offered little intrinsic satisfaction and almost no connection to the ultimate product the manufacturer produced. Marx wrote that, with the ever greater exertion demanded by the workplace, the more powerful the alien world around the industrial worker grows, "the poorer he and his inner world become."

Émile Durkheim

Émile Durkheim, the French thinker and sociologist, examined the business cycle in a new way, one that bore uniquely on psychological well-being. In his book *The Division of Labor in Society* (1984/1893), Durkheim advanced the idea that with industrialization, markets expand beyond local areas and become national (or international) in scope. With consumers so dispersed, the producer "can no longer figure out to himself [the market's] limits" with production lacking "any check or regulation," thus leading to miscalculations—upward or downward—of the size of demand (p. 305). The result is "crises that periodically disturb economic functions" (p. 305). This lack of regulation in the economy is an example of what Durkheim called "anomie."

In a later book, Durkheim (1951/1912) linked anomie to the risk of suicide. Using data from official records from a number of European countries, he found that increases in the number of suicides occurred during both the upward and downward phases of the business cycle. During the downward turn, the suicide rate increased. The suicide rate also increased during an uptick. He argued:

> If therefore industrial or financial crises increase suicides, this is not because they cause poverty, since crises of prosperity have the same result; it is because they are crises, that is, disturbances of the collective order. Every disturbance of equilibrium, even though it achieves greater comfort and a heightening of general vitality, is an impulse to voluntary death. (p. 246)
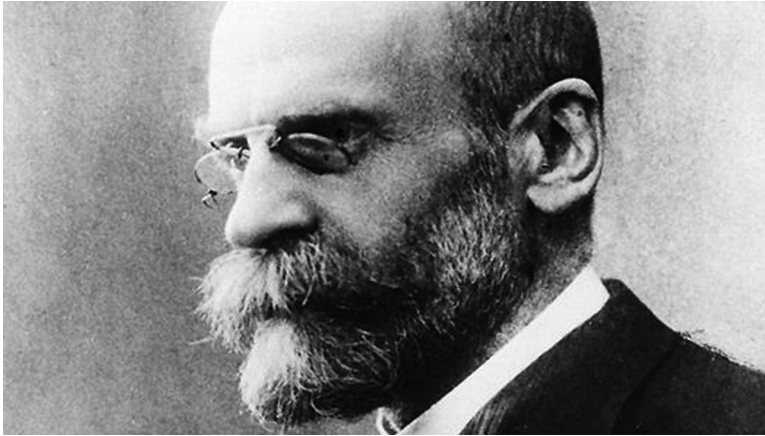
Émile Durkheim. (Photographer unknown. Copyright expired.)

He observed that poverty by itself is not related to increased risk of suicide. Rather, it is the cycling up and the cycling down that is associated with increased risk. Although not without methodological flaws, Durkheim's work on the business cycle is particularly important for OHP because his work closely links macroeconomic factors to intimate psychological outcomes.

Max Weber and the Iron Cage

The German sociologist Max Weber (1904–1905/1992) advanced a theory of the development of modern capitalism in the West. He viewed the growth of capitalism as an efflorescence of the Protestant faiths—particularly the Calvinist religions—that emerged in Europe with the Reformation.[1] In line with Calvinist religions such as Puritanism, work is seen as an ascetic "calling" that had religious significance. As this ascetic ethic of work became increasingly successful, it would largely strip itself of its religious significance. Weber wrote that this ethic

> began to dominate worldly morality, and did its part in building the tremendous cosmos of the modern economic order. This order is now bound to the technical and economic conditions of machine production which to-day determine the lives of all the individuals who are born into this mechanism. . . . Perhaps it will so determine [those lives] until the last ton of fossilized coal is burnt. (Weber, 1904–1905/1992, p. 181)

In Weber's view, what has become a highly rationalized, worldly morality dominates everyday life, and encloses the individual in "an iron cage."

Weber, in a book (1921/1947) published posthumously, described a theory of social and economic organization. He developed an idea for the advancement of

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[1] The theory in some respects is wrong. For example, Belgium, a largely Catholic country, was faster to industrialize than Scotland, a largely Calvinist country. The rightness or wrongness of the theory is not the issue here. The issue is that Weber's ideas fueled thinking about the impact of work and the economy on people's lives.

Photograph of Max Weber, circa 1894. (Photographer unknown. From the public domain, Wikipedia Commons.)

sociological theory that would resonate with theoretical developments in psychology. Weber's idea was that of the "pure type" or "ideal type." The ideal type is an abstraction that only imperfectly corresponds to any number of observable social phenomena. An example of an ideal type could be a perfectly rational course of action (in, say, a political campaign). A social theory encompasses a network of interconnections among ideal types. Because scientific theories concern the general rather than the particular, the ideal type serves as a device within the framework of a social theory that helps the theorist develop generalizations about social and economic life. Weber's ideal type can be thought to roughly correspond, in a general way, to the psychologist's idea of a construct, which is covered in Chapter 2.

Weber died in 1920 at a relatively young age, a victim of the Spanish flu pandemic, which swept a world exhausted by the Great War. His wife published a collection of his essays in 1922, one of which was devoted to a detailed analysis of the phenomenon of bureaucracy, a major feature of modern economic life. Weber (1922/1958)

noted the division of labor, hierarchical arrangements, and rule-boundedness of bureaucracies. He further observed that a bureaucracy functions without sentiment.

> Its specific nature, which is welcomed by capitalism, develops the more perfectly the more the bureaucracy is 'dehumanized,' the more completely it succeeds in eliminating from official business love, hatred, and all purely personal, irrational, and emotional elements. . . . (p. 216)

Weber's thinking about economic life—its formalization, bureaucratization, and routinization—had a profound influence on later research on the impact of work on the workers themselves (Tausig & Fenwick, 2011).

Taylor and Ford

Although Durkheim (1951/1912) recognized the underside of the division of labor (e.g., isolation, inequality), he argued that the division of labor also provides value for society (e.g., congruence between the individual's abilities and his role, greater interdependence among citizens). Frederick Winslow Taylor and Henry Ford played important roles in the application of the division of labor to the factory system.

Frederick Winslow Taylor

Frederick Winslow Taylor (1911), in writing about *scientific management*, redirected the idea of the division of labor. Taylor compared an American worker playing baseball and an English worker on the cricket pitch to the same worker returning to his (Taylor was largely discussing men) job the next day. Taylor noted that on the playing field, the worker "strains every nerve to secure victory for his side." But on the job, "this man deliberately plans to do as little as he safely can." He labeled this lack of engagement at work "soldiering." Taylor advanced the idea that a worker "soldiers" because the worker believes that increasing his output will result in men being thrown out of work. Taylor also complained that workers overly rely upon "inefficient rule-of-thumb methods" that impede optimal production. By rule-of-thumb methods Taylor referred to inexact traditional knowledge with which the worker grew up (e.g., a worker using his thumb to estimate an inch instead of employing a ruler). Taylor's aim was to improve production efficiency by developing techniques to rid factories of soldiering and rule-of-thumb methods by installing scientific management.

According to Taylor:

> Under scientific management the "initiative" of the workmen (that is their hard work, their good-will, and their ingenuity) is obtained with absolute uniformity and to a greater extent than is possible under the old system; and in addition to this improvement on the part of the men, the managers assume new burdens, new duties, and responsibilities never dreamed of in the past. The managers assume, for instance, the burden of gathering together all the traditional knowledge which in the past has been possessed by the workmen and then of classifying, tabulating, and reducing this knowledge to rules, laws, and formulae which are immensely helpful to the workmen in doing their daily work. (p. 27)

Hughes (1989) observed that although there were examples of Taylor's methods leading to increased production, "there is also abundant evidence of failures" (p. 195). The application of scientific management at Bethlehem Steel, for example, led to intense worker opposition. According to Hughes, many workers, especially those in the skilled trades, found the Taylorist trade-off involving loss of autonomy for higher wages a bad deal. The work of Henry Ford and his associates can be seen as the continuation of Taylorism.

Henry Ford

Around the time Taylor published his work, American manufacturing firms were becoming more and more mechanized. Consistent with Taylorist principles, individual workers in those firms were increasingly slotted into doing highly discrete tasks that they would repeat many times during the work day. Henry Ford and his engineers were creative innovators in the area of industrial production (Hughes, 1989). They also developed their ideas of industrial management independently of Taylor (Sorensen, 1956). Nonetheless, the assembly lines at the Ford Motor Company were the apotheosis of scientific management. Charles E. Sorensen, who played multiple roles (engineer, executive) at the Ford Motor Company, wrote, "It was then that the idea occurred to me that assembly would be easier, simpler, and faster if we moved the chassis along, beginning at one end of the plant with a frame and adding the axles and the wheels . . ." (p. 115).

Ford's advocacy of a division of labor into discrete repetitive tasks is reminiscent of an idea associated with Adam Smith (1976/1776). Smith described a "small manufactory" in which 10 workers produced pins. The workers were very productive because, instead of each worker producing whole pins, each worker was assigned a discrete, but highly repetitive, task. The tasks formed a coordinated ensemble.[2] What Smith described, however, was preindustrial and limited to economies that were small in scale (Heilbroner, 1986). Ford and Taylor, and Marx for that matter, were concerned with large-scale industrial economies.

Ford's assembly line revolutionized production. He offered higher wages and an 8-hour day. Fordism, however, was not without an underside. Fordist (and by implication Taylorist) principles led to the "increasing dehumanization of workers" (Wallace, 2003). Ford's River Rouge plant was run like a "totalitarian state in miniature" (Wallace, 2003). Harry Bennett, one of Ford's lieutenants, directed Ford's Service Department, popularly known as "Ford's Gestapo." Bennett employed a small army of ex-convicts, former prize fighters, and ordinary informants who spied on workers. Workers who aroused suspicions at the Ford plant were beaten. Service Unit members attacked union organizers. Walter Reuther, the head of the United Auto Workers union, was one of those assaulted and severely injured (Nolan, 1997; Wallace, 2003). The fast pace of assembly line work with little time for rest or going

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[2] Smith also foresaw that engaging in simple repetitive tasks hour after hour, day after day would have a deleterious effect on the mental functioning of the members of the vast laboring classes ("[the laborer] . . . generally becomes as stupid and ignorant as it is possible for a human creature. The torpor of his mind renders him, not only incapable of relishing or bearing a part in any rational conversation, but of conceiving any generous, noble, or tender sentiment" [p. 303, Vol. 2]). Smith went on to assert that in every civilized society, the state of mental torpor befalls "the laboring poor, that is, the great body of the people . . . unless government takes some pains to prevent it" (p. 303, Vol. 2).

Ford assembly line, Highland Park, Michigan, 1913. (Photographer unknown, Copyright expired. Wikipedia Commons.)

to the toilet (Linder & Nygaard, 1998) had an adverse effect on workers. There were high rates of accidents at Ford's famous River Rouge plant, but Ford concealed the accident rate by creating a kind of conveyor system that dispatched accident victims to Ford's own hospital (Cruden, 1932). Cruden reported on the prevalent feelings of nervous tension among Ford's line workers.

It is not surprising that leaders of totalitarian regimes admired Ford and Taylor. Lenin, the exponent of scientific socialism, was smitten with scientific management (Hughes, 1989). Lenin, Trotsky, and Stalin expressed admiration for Ford's and Taylor's methods. In a 1924 address, Stalin (1940) expressed his high regard for Taylorist methods pioneered in the United States:

> American efficiency is that indomitable force which neither knows nor recognises obstacles; which with its business-like perseverance brushes aside all obstacles; which continues at a task once started until it is finished, even if it is a minor task; and without which serious constructive work is inconceivable. (p. 85)

Taylorist experts were brought from the United States to the nascent Soviet Union to help implement those methods in Russia (Hughes, 1989). The Ford Motor Company constructed a plant in Nizhny Novgorod. Ford, equally, had admirers in Nazi Germany (Wallace, 2003). In 1937, the Nazi government awarded Ford the Grand Cross of the German Eagle, the highest honor it could award a non-German, for his "humanitarian ideals" (Baldwin, 2001; Wallace, 2003).

Taylorism and Fordism became associated with dictatorial methods of improving workplace efficiency (Linder & Nygaard, 1998; Wallace, 2003). With this dictatorial focus on efficiency, the movements became associated with political dictatorships as well.

WORLD WAR I AND THE INTERWAR YEARS

It is expected that war would adversely affect the health in the civilian population, including that of workers. Using historical life insurance data, Winter (1977) found the opposite, at least for a country that was not invaded: "When the Prudential evidence of increased life expectation for civilian workers is also taken into account, it is clear that war conditions benefited in particular the non-combatant labouring population" (p. 502). After the outbreak of World War I, the British government was prompted to examine conditions of workers in munitions factories. The Health of Munition Workers Committee (1915) recommended that workers be given Sundays off. The Committee wrote,

> Continuous work is . . . a profound mistake, not only on social and religious grounds, but also economically, since it does not pay, the output not being increased. The output is not increased partly because men become bored and wearied with the monotony of the work. (p. 864)

In addition to rest periods, industrial canteens were established to ensure that munitions workers received nutritious meals (Health of Munition Workers Committee). By 1917, more than 700 of such canteens had been established (Winter, 1977).

Impact on Soldiers

War can have a terrible impact on the individuals in the military services. Siegfried Sassoon (1918), one of Britain's outstanding war poets, wrote:

> They leave their trenches, going over the top,
> While time ticks blank and busy on their wrists,
> And hope, with furtive eyes and grappling fists,
> Flounders in mud. O Jesu, make it stop!
> [Excerpted from the poem *Attack* by permission of the estate of Siegfried Sassoon]

Sassoon, who, while under fire, rescued a wounded soldier and later "single-handedly captur[ed] a German trench" on the Hindenberg Line, became an opponent of the War (Hochschild, 2011).

In the view of Freud (1956/1919), the emergence of so-called war neuroses involved an internal conflict, largely unconscious, between the conscript's "peaceful ego" and the former civilian's new, warlike one, superimposed on him by his military training and battlefield experience. The conscript's old peace ego "protects itself from a mortal danger by taking flight into a traumatic neurosis" (p. 209). Freud suggested (wrongly) that (a) war neuroses would be largely absent in a professional army and (b) those suffering from war neuroses would improve on the heels of the war's end. Freud opposed punishing soldiers suffering from war neuroses, declaring that the great majority of the casualties were not malingerers. He was particularly critical of German physicians "serving a purpose that was foreign to them," namely patching up psychologically wounded soldiers (often with electroconvulsive shock) and sending them back to the front. In Britain, Rivers (1918) advanced the view that the impact of the war on the mental health of soldiers can result from their repression of horrific war experiences. By repression, he did not necessarily mean the unconscious Freudian mechanism,

although the influence of Freud on Rivers's thinking is clear. Rivers described a voluntary attempt "to banish from the mind the distressing memories of warfare or painful affective states which have come into being as the result of [soldiers'] war experience" (p. 173). The affective states to which he referred included feelings of shame that a soldier experiences when he thinks he may be deemed a coward by others.

Although he agreed with Rivers on the role of repression in war neuroses in soldiers, MacCurdy (1918) described a tension facing clinicians attempting to uncover the sources of mental health problems in soldiers engaged in trench warfare. On the one hand, MacCurdy believed that earlier "psychoneurotic tendencies" in individuals in civilian life are likely to predict later breakdown in warfare. On the other hand, he wrote that individuals with "a history of previous breakdowns or of having had tendencies toward psychoneurotic reactions in their past life [have] . . . nevertheless adapted themselves well to training and fought well" (p. 130). MacCurdy noted the great fatigue the experience of trench warfare often produced in soldiers. Fatigue was often a prelude to war neuroses. Although he did not mention brain injury, MacCurdy reported on the terrible role of the concussive impact of shells in precipitating anxiety reactions in soldiers in the trenches, who, if not killed were often buried under mounds of earth and had to be dug out by fellow soldiers.

These war neuroses should be viewed from within a larger context. Adam Hochschild (2011) documented the incredible stupidity and callousness with which the British high command threw men into the Battle of the Somme. On July 1, 1916, in the first hour of the attack, 19,000 British were dead. A total of 57,000 men were dead or wounded the first day. General Douglas Haig "doggedly, unyieldingly sent out order after order for more attacks on the Somme, and these would continue for an astonishing four and a half months" (p. 208). Operating under a "perverse logic," Haig associated German casualties with British losses, becoming angry when he considered British losses in an engagement to be too low. In the end, the British suffered 500,000 casualties and the French, 200,000. The command also failed to attain its territorial objectives.

The British author C. S. Lewis (1955), who served in France during the Great War, observed:

> But of the rest, the war—the frights, the cold, the smell of H.E.,[3] the horribly smashed men still moving like half-crushed beetles, the sitting or standing corpses, the landscape of sheer earth without a blade of grass, the boots worn day and night till they seemed to grow to your feet—all this shows rarely and faintly in memory. It is too cut off from the rest of my experience and often seems to have happened to someone else. (p. 185)

In his autobiography of his early life, from which the just-cited passage comes, Lewis wrote less about the appalling aspects of the war than about reading the essays of G. K. Chesterton while convalescing from an episode of trench fever; this passage, which is all that he wrote about combat, amounted to no more than an interjection. Perhaps given the physical and emotional pain he suffered, Lewis had largely fenced off his memories of combat. Lewis and two friends had been victims of friendly fire. In the Battle of Arras in 1918, a British shell aimed at the Germans landed on the three, killing the two friends, a highly competent sergeant whom Lewis venerated

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[3] H.E. is an abbreviation for high explosives.

After the battle. A scene on the Menin Road. Wounded waiting to be taken to the dressing stations.

Wounded Australian soldiers, France, 1917. (Photographers James Francis [Frank] Hurley and George Hubert Wilkins. Official Australian War Photographs, produced by the Australian War Records Section, established by the British government in 1917. National Media Museum. Copyright expired. Creative Commons.)

and a fellow officer and intellect who Lewis believed would have become a lifelong friend; Lewis suffered multiple shrapnel wounds (Wilson, 1990). Lewis suffered another loss; his dear friend Paddy Moore went missing in action, and was presumed dead. In surviving the War, Lewis suffered headaches and nightmares (Jacobs, 2005).

Large numbers of surviving combatants became psychiatric casualties. "So many officers and men suffered shell shock, that, by the end of the war, the British had set up 19 military hospitals solely devoted to their treatment" (Hochschild, 2011, p. 242). In yet another example of supreme callousness, British military authorities sometimes accused shell-shocked soldiers of cowardice, and executed them (Hochschild). "Shell shock," a term that embraced a variety of conditions including the concussive effects of exposure to exploding ordnance and emotional disorders that develop in a variety of combat situations, was the term then commonly used (Great Britain. War Office, 2004/1922). In 1916, British physician Frederick W. Mott (1916a, 1916b) described an autopsy study he performed on two soldiers who died soon after having been exposed to explosive blasts. To take one of the two cases, Mott (1916b) observed that "there is no wound of any kind on his body or head, and no visceral lesion" (p. 442). He found hemorrhages in the brain's white matter and the basal ganglia. He surmised that the blast wave itself was the cause of the death.[4] The modern equivalents of shell shock include posttraumatic stress disorder and/or traumatic brain injury.

The early work on shell shock was important because there was now scientific discussion of psychological and neurological trauma resulting from exposure to war. This early work paved the way for later research during World War II. Eventually, OHP-related research, which embraces many occupations, would embrace research on exposure to war.

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[4] See Chapter 11 for the most recent research on the impact of blast waves.

THE INTERWAR YEARS

Two important developments occurred during the interwar years that would influence the later emergence of OHP. The first was the appearance of efforts to understand the human relations side of organizations. Great Britain saw the institution of rest periods in munitions factories during World War I. The idea that rest periods would lead to improved productivity in U.S. workers, which was essentially a Taylorist notion, took root after the war. Ironically, this Taylorist idea precipitated a change in thinking that was more oriented to understanding the human side of organizational processes.

The second development was the Great Depression, which created mass unemployment. There was an impetus to conduct research designed to understand the psychological impact of unemployment.

Human Relations

Elton Mayo (1924), an Australian researcher working in the United States, closely studied a Philadelphia textile mill. The mill's spinning department had been suffering from a turnover rate of over 200% per year. Mayo observed that the repetitive nature of the work in the spinning department "make[s] for the development of pessimistic or other abnormal preoccupations" (p. 280). Mayo's solution was the implementation of a series of rest periods. Given Mayo's work in Philadelphia, it was natural for him to become involved in the Hawthorne studies.

Beginning in 1924, a number of studies were conducted at the Western Electric Company's Hawthorne plant in Cicero, Illinois, near Chicago. The Hawthorne studies had, at one time, so much prestige that one commentator (Hart, 1943) suggested that the research was the social science equivalent of the discoveries of Galileo and Mendel. From 1924 to 1927, the famous Hawthorne illumination studies took place at plant locations where workers (usually women) assembled relays. The studies are associated with the "Hawthorne effect," an effect that suggests that many different changes in working conditions or observer attention can lead to improvements in worker productivity. The effect turns out to be more myth than reality, given analyses of unearthed archived data (Levitt & List, 2011).

Another Hawthorne study began in 1927 and continued until 1932. It was on this study that Mayo (1933) focused much of his attention. The 1927 to 1932 study was better documented than the illumination studies. It involved five women who had been working in a large area with many other workers, assembling relays for the telephone company. The five were selected to work in a separate Relay Assembly Test Room (Mayo, 1933). During a sequence of 23 "experimental periods" (these periods did not really constitute an experiment with random allocation to treatment and control conditions), a series of changes was imposed on the five (two of the workers dropped out of the group, and were replaced midstream). The workers' output was measured during each period. The changes included the imposition of rest periods throughout the workday and alterations in their length and number. Another change that lasted through much of the study was that the workers' pay was tied to the output of the small group; formerly, their pay was tied to the output of the much larger group of workers from which the five were selected.

Mayo commented on the increases in the workers' output accompanying many (but not all) of the changes in the conditions in the Assembly Room:
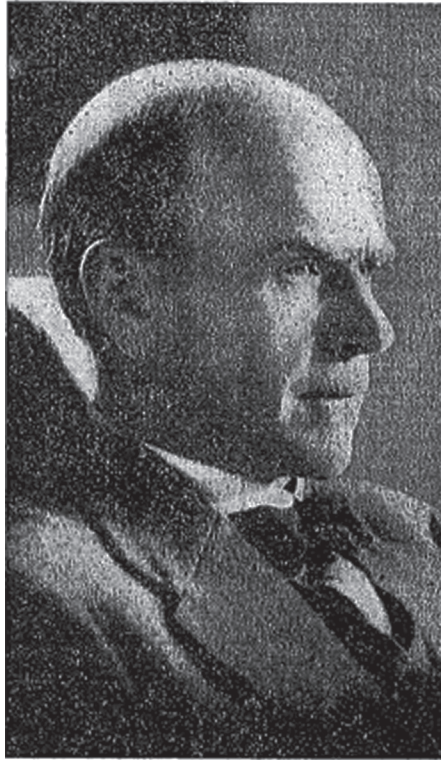
Elton Mayo (Photograper unknown. Undated photograph published in the University of Queensland Gazette, by permission of the Fryer Library, The University of Queensland Library.)

> the individual workers and the group had to re-adapt themselves to a new in-
> dustrial milieu, a milieu in which their own self-determination and their social
> well-being ranked first and the work was incidental. The experimental changes—
> rest-periods, food, and talk at appropriate intervals—perhaps operated at first
> mainly to convince them of the major change and to assist the re-adaptation. (p. 73)

Although this view is at most an exaggeration (Bell, 1947; Parsons, 1974), the idea advanced by Mayo is that improving working conditions, including psychosocial work-ing conditions (e.g., "self-determination," opportunities to talk with fellow workers), has a beneficial impact on both worker well-being and productivity. Roethlisberger and Dickson (1939), other Hawthorne researchers, concluded that "the effects of the experimentally introduced changes in working conditions . . . proved to be carriers of social meaning rather than mere changes in physical circumstances" (p. 140).

The collective work of Mayo, Roethlisberger, and Dickson contributed to the development of the human relations movement in management. The movement recognized that "beneath the formalities of the organization chart was not chaos but a robust, informal organization, constituted by the activities, sentiments, interac-tions, norms, and personal and professional connections of individuals and groups that had developed over extended periods of time" (Anteby & Khurana, n.d.). At the Harvard Business School (HBS), where both Mayo and Roethlisberger were profes-sors, the dominant Taylorist management principles that were once taught gave way to less mechanistic principles that stressed the fact that human relationships are an

important part of the success of organizations. Bell (1947), expressing a dissenting view, advanced the idea that Hawthorne and studies like it reflected efforts at "greasing the skids" for factories and that command structures essentially continued to deny workers the kind of autonomy that humanizes workplaces.

Unemployment

Marie Jahoda was one of the first women to make a mark in the male-dominated social sciences. In 1933, Jahoda, Paul F. Lazarsfeld, and Hans Zeisel (1971/1933) published a groundbreaking book describing their research on residents of a small Austrian community. This community experienced very high levels of unemployment throughout the 1920s. The research team found that over time, unemployed community members became less engaged in everyday activities, becoming steadily more apathetic. Although Jahoda et al. collected a good deal of qualitative data, they also collected quantitative data that underlined the growing apathy. For example, from 1929 to 1931, the last year data were collected, the number of books the average resident borrowed from the library declined. Membership in the leading political party of that area also declined. Life history interviews with residents underlined the aimlessness of the residents' lives. Thus, Jahoda and her colleagues documented the psychological costs of unemployment and the Great Depression.

Marie Jahoda. (Photographer unknown. By permission of the Archiv für die Geschichte der Soziologie in Österreich, University of Graz.)

FROM THE WORLD WAR II ERA TO THE 1970S

The next section covers a period during which pioneering research and institution building took place. Some of the research took place during wartime, and concerned the impact of war on soldiers. After the war, investigators began to demonstrate that rigorous scientific methods could be applied to the study of the impact of psychosocial workplace factors on the health of workers in civilian jobs. The period was an era of institution building that has been relevant to OHP. It was also an era in which stress increasingly became the subject of articles and books.

World War II

During World War II, psychiatrists, psychologists, and sociologists took an interest in the so-called psychiatric casualties in the military. Samuel A. Stouffer and his colleagues (1949) published the watershed study of U.S. servicemen, *The American Soldier*, based on research conducted during the war, and involving large samples of Army personnel. Although anxiety problems and psychiatric casualties constituted just one part of their research, *The American Soldier* research was revolutionary in its application of social science methods to understanding the psychology of the soldier. Stouffer and his colleagues pioneered the development of instruments to ascertain the level of anxiety and psychosomatic symptoms experienced by the men. They anticipated the development of screening instruments that would be used in future research (Dohrenwend & Dohrenwend, 1982), particularly in research aimed at identifying probable psychiatric cases.

Stouffer et al. (1949) found that a higher proportion of breakdowns occurred in men during their first months in the service than during any other period of service. More importantly, they found that the intensity of exposure to combat was directly related to the men's risk of developing elevated levels of anxiety and psychosomatic symptoms. Even soldiers in the European Theater of Operations in April 1945, "when allied armies were advancing rapidly and the sense of imminent victory was in the air," experienced high levels of anxiety symptoms (p. 442). For example, 44% of the men aged 20 to 24 with some high school education experienced anxiety symptoms in the critical range. Stouffer et al. (1949) found extremely high rates of elevated levels of anxiety symptoms in veteran replacements who were about to return to combat in the central Pacific after a spell in the hospital (71% to 86%, depending upon age and educational level).

This is not to say that American servicemen experiencing high levels of combat stress were poor soldiers. They were not. Spiegel (1944), a psychiatrist who observed American troops in the Tunisian campaign, wrote that "not only was some of the gallant and heroic work done by men and officers in acute anxiety states, but a considerable amount of the ordinary combat accomplishment was performed by ordinary men experiencing rather severe anxiety" (p. 383). Good morale was related to the quality of company and platoon leadership. The capable leader

> saw to it that his men got the best possible food under the circumstances; sent blankets up to them at night if it were possible; made every effort to keep them well supplied with water and ammunition; saw to it that that promotions were fair; made certain that good work and gallantry were properly recognized; he got mail, news and information to them quickly. (Spiegel, 1944, p. 384)

Members of the 356th Fighter Group, Eighth Air Force, U.S. Army Air Corps, Ipswich, England, 1943. The airman who is second from the left is George Schonfeld, the father of the first author. (Photographer unknown. Property of Irvin Sam Schonfeld.)

Roy Laver Swank (1949) was one of the first clinicians to examine the phenomenon then known as "combat exhaustion" using large samples of soldiers. He examined troops who served in the European Theater of Operations. In World War I, the term most commonly used was "shell shock." Swank observed among the casualties a great deal of fatigue. He also observed that the affected soldiers "lost their confidence, became irritable and agitated and appeared anxious. Later, other symptoms, namely, [psychomotor] retardation, preoccupation, mental defect and apathy," developed (p. 475). Swank found that combat exhaustion was severest and had earlier onsets in soldiers who served in units that suffered the highest casualty rates. Contrary to MacCurdy (1918), Swank also found that precombat stability was not related to combat exhaustion in men exposed to combat over long periods of time.

The research conducted by Stouffer and his associates (1949) and Swank (1949) on the impact of exposure to combat was superior to the research conducted during World War I. Research conducted during World War II did not blame the psychiatric causality. The hunt for causes identified the length and intensity of combat exposure and unit casualty rates. Research by Spiegel (1944) indicated that soldiers experiencing high levels of anxiety could acquit themselves well on the battlefield.

Institute for Social Research

OHP is quintessentially interdisciplinary. Interdisciplinary research requires robust institutional support. An example of the growth of institutional support comes from the history of the University of Michigan. In 1930, social scientists from eight different departments at Michigan organized the Social Science Research Council of Michigan (Frantilla, 1998; Institute for Social Research, n.d.). One of the aims of the Council was to advance cooperation across departmental lines.

Soon after the close of World War II, an institutional development affected the course of the social sciences. Rensis Likert, the creator of the famous Likert-type scale, founded the Institute for Social Research (ISR) at Michigan (Frantilla, 1998). Likert

Undated photograph of the construction of a building to house the Institute for Social Research at the University of Michigan. (Photographer unknown. Photo courtesy of the University of Michigan, Institute for Social Research.)

initially founded the Survey Research Center in 1946. Then, in 1948, the Research Center for Group Dynamics moved from MIT to Michigan. In 1949, both Research Centers became divisions within the ISR umbrella organization (Cannell & Kahn, 1984). With time, other research centers were created, and came under the aegis of ISR. Research conducted by ISR staff has been supported by grants and contracts, and not out of the University's budget. ISR evolved into a kind of empyrean heaven for social science research. Although initially centered on social psychology, ISR research crossed disciplinary boundaries to include political science, sociology, and economics in addition to fields such as epidemiology, psychiatry, and statistics (Cannell & Kahn, 1984). ISR investigators have conducted research bearing on the interrelationships among work, well-being, and health (e.g., Caplan, Cobb, & French, 1975; House, 1980; Quinn & Staines, 1979).

Tavistock and Human Relations

The Tavistock Clinic, a psychoanalytically oriented psychiatric center, was established in London in 1920. During World War II, leaders of the clinic entered the Directorate of Army Psychiatry to use their skills to help troubled soldiers and to address problems related to morale in the British military. Trist and Murray (1990) underscored the emerging interdisciplinary character of the military-related efforts of the Tavistock Clinic group: "To meet these large-scale tasks the range of disciplines was extended from psychiatry and clinical psychology to social psychology, sociology and anthropology." In 1946, the leaders of the Tavistock Clinic organized the Tavistock Institute of Human Relations. Initially a division of the clinic, in 1947 the institute became independent. The institute promoted psychoanalytically oriented and social psychological research on human relations. In 1947, members of the institute and members of the Research Center for Group Dynamics established a new journal, aptly named *Human Relations*, for the purpose of furthering "the integration

of psychology and the social sciences and relate theory to practice" (Trist & Murray, 1990; also see *Human Relations*, 2012).

Changes in the British Mining Industry

In 1951, Eric Trist and Kenneth Bamforth published in *Human Relations* an influential article on the effects of changes in the British coal mining industry on miners. Trist was one of the founding members of the Tavistock Institute, and Bamforth, a former coal miner, was a fellow there. Trist and Bamforth found that changes in the organization of work led to a reduction in the miners' autonomy:

> Superficially, borers, belt-builders, and belt-breakers look like pair structures that echo pre-mechanized days. But whereas the pairs of hand-got coal-getting had craft status and an artisan type of independence in working their own [coal] face, with the satisfaction of seeing through the whole coal-getting job, these longwall pairs are restricted to work tasks of singularly narrow component character. (p. 36)

Trist and Bamforth noted the "fractionated tasks" led to the miners losing a "sense of belonging" with the other members of their shift or production group. The research belied an early recognition of the importance of job-related autonomy for worker well-being.

Hans Selye

In 1956, endocrinologist Hans Selye published an influential book entitled *The Stress of Life*. Although not written with job stress in mind, his work influenced future research on general life stress as well as OHP research. His research since the 1930s was built on a foundation laid by scientists such as Walter B. Cannon. At this juncture, it is helpful to review some of what Cannon (1914) found before turning to Selye.

In a series of animal experiments, Cannon underlined the activation of the sympathetic adrenal-medullary (SAM) system in response to emotion-provoking challenges. Sensory impulses "aroused by the natural events in the course of an animal's life" (p. 357) are channeled to the adrenal glands, which rest atop the kidneys. The adrenal medulla, the central part of the adrenal glands (the adrenal cortex surrounds the adrenal medulla), in turn releases the hormone adrenaline (epinephrine) into the bloodstream. Adrenaline precipitates glycogenolysis, the conversion of glycogen stored in the liver and in muscle tissue into glucose, better preparing for the action of key muscles (e.g., the heart) that help the animal fight or flee a predator. Other muscles not important to fight or flight (e.g., muscles in the alimentary canal) experience a reduction in activity. Cannon (1929) later introduced the idea of homeostasis, which involves self-regulation and the maintenance of stable levels of temperature, protein, glucose, fat, oxygen, and so forth despite the presence of "continually disturbing conditions." Tendencies toward change are "automatically met."

Building on Cannon's research, Selye (1956), who also worked with animals, examined the response of the organism to foreign biological or chemical agents that potentially disturb homeostasis and to which the organism restoratively responds. Selye noted that the organism's responses are similar for many different disturbances. He also observed that people who were affected by a variety of diseases often shared

many common symptoms. Selye used the term "stress" to describe a syndrome that includes "all the nonspecifically induced changes within a biologic system" in response to an aggressive outside agent, that is, the stressor (p. 54), and that some stress benefits the organism. He labeled the totality of the nonspecific response to a stressor the "general adaptation syndrome" (GAS). The syndrome comprises three stages: "(1) the alarm stage," "(2) the stage of resistance," and "(3) the stage of exhaustion." The GAS response involves the rapid mobilization and orchestration of the pituitary gland, the adrenal medulla and cortex, and the central and autonomic nervous systems.

Selye was concerned with the stress process as it unfolds in response to objective features of the environment: "physiological responses to environmental stimuli might occur without any subjective assessment of those stimuli" (Hurrell, Nelson, & Simmons, 1998, p. 369). Consistent with this view, Selye noted that "during World War II, veritable epidemics of 'air-raid ulcers' occurred in people living in some of the heavily blitzed cities in Great Britain" (p. 179).

Selye,[5] in the revised edition of his book (1976) and elsewhere (1985), amended the ideas about which he previously wrote. In his revised scheme, sensory input mediated by the cerebral cortex, the limbic system, and reticular formation reaches the hypothalamus. The hypothalamus, upon receiving the signals, produces corticotrophic hormone releasing factor (CRF). CRF, by way of the bloodstream, arrives at the pituitary gland, precipitating the pituitary's release of adrenocorticotrophic hormone (ACTH) into the circulatory system. In response to ACTH, the adrenal cortex releases glucocorticoids such as cortisol and corticosterone, which stimulate glycogenolysis, supplying energy for the muscles to respond to demands during an alarm state (glucocorticoids are not as important during the later resistance stage). ACTH also triggers the secretion of adrenaline and noradrenaline, that is, the catecholamines epinephrine and norepinephrine, in the adrenal medulla; nerve endings in the autonomic nervous system are also a site for catecholamine synthesis. Adrenaline triggers the formation of glucose from glycogen (as just mentioned) and from triglyceride stores; adrenaline also improves circulation to the muscles by increasing both pulse rate and blood pressure. What is outlined is the action of the hypothalamic–pituitary–adrenal (HPA) axis in the stress process.

Stressful Life Events

A line of research flowed out of Selye's work. His original 1956 book suggested that stressors can affect human health in nonspecific ways, and cause a variety of illnesses. In the 1960s, researchers began to examine the link between life events (LEs) and illness (Rahe, Meyer, Smith, Kjaer, & Holmes, 1964). LEs refer to events that cause different degrees of social readjustment (e.g., marriage, divorce, death of a loved one).

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[5] There was also an underside of Selye's research. Selye received from the tobacco industry extensive support for his research on stress (Petticrew & Lee, 2011). Petticrew and Lee found that Selye advanced the ideas that (a) smoking can be beneficial as a stress-reducer and (b) antismoking campaigns can cause stress in members of the public. The authors observed that "Selye's expert evidence diluted existing evidence of the adverse effects of smoking and distracted attention from its harms. In failing to declare his receipt of tobacco funding when expressing his views against tobacco control, documents suggest he concealed a lack of scientific independence" (p. 414).

Some LEs are beneficial, others neither beneficial nor harmful to the individual, and still others are stressful. In the years after Holmes and Rahe's (1967) publication of their Social Readjustment Rating Scale (SRRS), research on the impact of stressful life events (SLEs) on health, particularly mental health, accelerated. Research on the health effects of SLEs largely concerned life in general, although a SLE such as getting fired would be included in LE inventories such as the SRRS. There was also a natural bridge from research interest in general life stress to research interest more specifically devoted to work-related stress (Karasek, 1979).

Stress Research in Sweden

Following Selye's research, investigators in Sweden studied the impact of work arrangements on SAM reactions. Sweden had become a center of stress research, with Lennart Levi founding the Stress Research Laboratory in 1959 and going on to establish the National Institute for Psychosocial Factors and Health in 1980 (Theorell, 1997). Levi (1972) found that a short-lived change from hourly wages to piece work was accompanied by increases in output as well as increases in adrenaline and noradrenaline. When returned to hourly wages, there were accompanying declines. Frankenhaeuser (1979; Frankenhaeuser & Gardell, 1976) found that compared with men in control jobs, men working at a sawmill in monotonous, machine-paced jobs showed high levels of adrenaline and noradrenaline excretion along with high levels of psychosomatic symptoms.

Developments in Sociology, Social Psychology, and Industrial Psychology

A number of social scientists including Ely Chinoy, a team made up mostly of ISR researchers, and Arthur Kornhauser, spurred interest in research on work, stress, and well-being. In 1955, sociologist Ely Chinoy published a book based on his research on blue collar workers. Having intensively interviewed 62 men who worked in a U.S. automobile manufacturing plant, he painted a picture of the monotony of the workers' blue collar jobs, and their search for satisfaction outside of work. Chinoy underlined two different ways in which the men experienced feelings of alienation. First, there is little opportunity for advancement. Second, the nature of the highly mechanized work required "the surrender of control over their own actions" (p. 85). The idea that control (or its absence) is an important feature of work reemerges with the research of Robert Karasek, which will be covered later in this chapter and in Chapters 3 and 4. Some of the men had pipe dreams such as fantasies of starting a farm. The dreams, however, were just that, dreams. The independence and autonomy that the dreams implied required more capital and training than the men, who were largely born into working class families, possessed. Chinoy anticipated the answer to a question later posed by Johannes Siegrist, whose work is discussed in Chapter 3, regarding why workers often remain in unrewarding jobs. Chinoy underlined the fact that costs of leaving and obtaining more satisfying jobs are major barriers.

In 1964, a team of social psychologists, three of whom were researchers at ISR, published a book describing innovative research on organizational stress. The book was published in an era when psychodynamic psychology was ascendant, and psychologists tended to locate the causes of psychopathology intrapsychically, and in the relationship of the individual with his or her parents. Kahn, Wolfe, Quinn, Snoek,

and Rosenthal, however, were concerned with how organizational role relationships, combined with personality dimensions, affect job-related tension, job satisfaction, sense of futility at work, and so forth. They were also among the first researchers to study work-related coping. The team organized two studies, one of which was a survey of a nationally representative sample of U.S. workers, and the second an intensive investigation of 53 men in supervisory positions in "six industrial locations" in the United States. An innovation of the study was their interviewing the members of each focal person's "role set," that is, the collectivity of individuals in different roles, subordinates, supervisors, and individuals at the same level, whose own roles directly affected that of the focal person. The interviews assessed the pressures exerted on the focal person to change his performance; these pressures became the source for a measure of role conflict. Role ambiguity was assessed from data collected from the interview of the focal person. The authors found that conflict and ambiguity were linked to job-related tension. A methodological innovation of the study was that the investigators assessed role conflict and tension independently of each other; a methodological problem facing research on the psychological impact of working conditions has been how to assess the independent (e.g., psychosocial job stressors) and dependent variables (e.g., distress) without the assessment of one contaminating the assessment of the other. Although the study's results were far from eye-opening (e.g., role conflict and neurotic anxiety "combine additively" to affect tension), the research added momentum to psychology's efforts to evaluate the joint effects of job and person variables on health outcomes.

Arthur Kornhauser was a psychologist who became involved in industrial psychology. What distinguished him from his disciplinary colleagues who were "largely concerned with problems of increasing industrial efficiency" (Zickar, 2003, p. 366) was his interest in the plight of working people. In 1965, he published a book in which he described landmark research that combined qualitative and quantitative methods in a study of 407 male workers at 13 Detroit automobile manufacturing plants and a comparison sample comprising 248 men working outside of Detroit in manufacturing and nonmanufacturing jobs. Based on interview data, he found that the skill and responsibility required by a worker's job were inversely related to his mental health. In other words, workers with highly repetitive, semiskilled jobs were at risk for the worst mental health, and workers having jobs that required greater skill and responsibility tended to have better mental health. An innovation in his research included the development and validation of his measures of mental health. Another innovation was his concern for the possibility that the workers at risk for poor mental health had self-selected for the lowest-level jobs. Kornhauser adduced evidence to suggest that selection did not explain his findings. He also linked mental health to job satisfaction. In order to disentangle the effects of the worker's personality and the effects of the job, he advocated the use of longitudinal methods in future research on the mental health of workers. His study also pioneered efforts to examine "spillover" into life outside of work of negative feelings adverse work situations provoked.

The research by Kornhauser, Chinoy, and the team led by Kahn fueled interest in the impact of work on the health of workers. Contemporary research in OHP owes much to these investigators (Quick, 1999; Sauter & Hurrell, 1999). A number of themes emerged from their research, including concerns about worker autonomy, the impact of highly repetitive work, job-related conflict, the problem of selection, and the need for longitudinal studies.

Richard Lazarus

Although he has been a psychologist whose ideas apply to psychological stress in general, Richard Lazarus's 1966 book was influential in OHP circles. In Lazarus's model, an individual is informed by a number of antecedent characteristics, including motives, beliefs, and past learning. When confronted with a new "stimulus configuration," the individual appraises it for level of threat or anticipated harm; Lazarus called this initial evaluation "primary appraisal." Whether a circumstance is deemed a threat or not depends upon cognitions such as a person's judgment that the situation is likely to block the individual from attaining goals. The individual's personality and life history bear upon this appraisal. Threat appraisal comes between the stimulus configuration and the individual's reactions to it. Lazarus saw threat as being different from anxiety in that the latter is one of several potential affective consequences of a threat. OHP researchers with a Lazarus-type orientation have been concerned with the features of the work environment that are appraised as threatening.

In response to a threat, the individual often engages in coping behaviors. Coping refers to "strategies for dealing with threat" (Lazarus, 1966, p. 151). It includes action directly taken to change a threatening circumstance or the utilization of psychologically defensive maneuvers such as denying the threat or painting the threat picture in a rosier color. In addition to primary appraisal, Lazarus also developed the concept of secondary appraisal, which is another round of appraisal that refers to the individual's evaluation of the consequences of his or her coping actions. Along with Lazarus, Beehr and Newman (1978; Newman & Beehr, 1979) were particularly influential in encouraging research on work-related coping.

The appraisal idea has not been without its critics. Dohrenwend and Shrout (1985) found that a stressor measure developed by Lazarus and his colleagues (1985), one that relied on participant appraisal, was confounded with psychological symptoms. Dohrenwend and Shrout argued that measuring pure environmental events uncontaminated by appraisals and reactions is important to understanding the stress process. They suggested that researchers also assess an event's context, which includes vulnerability factors and resources, including the present social situation and personal dispositions that may modify the impact of the event on well-being.

Public health–oriented OHP researchers have been intent on characterizing objective features of the psychosocial work environment (Kasl, 1987) that affect the health of workers. Objective features of the environment are subject to change by way of interventions. Conversely, appraisals of events are personal, and put more of the burden of the environment's health effect on the worker.

Methodological Rigor in Research on Job Stress

Convincing evidence began to mount that researchers can employ rigorous methods to examine the link between work-related psychosocial conditions and physical health. Meyer Friedman, Ray Rosenman, and Vernice Carroll published perhaps the first such study in 1958. They examined fluctuations in serum cholesterol and blood clotting time as a function of stress in two groups of male accountants. One group, U.S. tax accountants, whose work chiefly involved completing tax returns, experienced severe job stress from April 1 to 15, the deadline for filing. The other group, specialized in corporate finance, experienced severe stress in the month of January (because of deadlines for corporate reporting) and from April 1 to 15. Friedman et al.

(1958) found that, independent of diet, weight, and exercise, periods of extreme occupational stress were related to faster blood clotting times and elevations in serum cholesterol, both risk factors for heart disease.

Some years later, two ISR researchers, Stanislav Kasl and Sydney Cobb (1970), published an influential paper concerning the impact of unemployment on blood pressure. Kasl and Cobb's study involved men experiencing plant closings and controls who were men continuously and comparably employed. The investigators were able to link job loss and unemployment to increases in blood pressure and reemployment to decreases.

In 1973, the ISR team of Sydney Cobb and Robert Rose published an article that linked job conditions to health outcomes in all-male samples. Cobb and Rose found that in comparisons with U.S. Air Force enlistees, air traffic controllers, an ostensibly high-stress job, showed higher rates of hypertension and peptic ulcer. Compared with men working in low-traffic towers, men working in high-traffic towers were at significantly higher risk for both hypertension and ulcer.

Thus, the studies conducted by Friedman et al. (1958), Kasl and Cobb (1970), and Cobb and Rose (1973) demonstrated to future investigators that rigorous research in which psychosocial workplace characteristics could be operationalized and linked to health outcomes could be conducted. Beehr and Newman (1978) observed that industrial and organizational (I–O) psychology had resisted research on work and health, and urged I–O and other psychologists to engage in rigorous research on work, stress, and health.

OSHA and NIOSH

A major legal milestone in the history leading up to the emergence of OHP came about when the United States Congress passed and President Nixon signed Public Law 91-596, the Occupational Safety and Health Act (Occupational Safety and Health Act of 1970). The purpose of the law has been to ensure safe and healthy working conditions for American workers. The Occupational Safety and Health Administration (OSHA), which the act created, and the Department of Labor (DOL) were assigned the responsibility of setting and enforcing health and safety standards at U.S. workplaces. OSHA became part of the Department of Health, Education, and Welfare, but is now part of the Department of Health and Human Services.

PL 91-596 also authorized the creation of the National Institute for Occupational Safety and Health (NIOSH), which eventually became a unit of the CDC. The law gave NIOSH a research mandate:

> (1) to conduct such research and experimental programs as [the Director of NIOSH] determines are necessary for the development of criteria for new and improved occupational safety and health standards, and (2) after consideration of the results of such research and experimental programs make recommendations concerning new or improved occupational safety and health standards.

NIOSH does not write health and safety regulations. NIOSH's research findings inform the regulation process at OSHA and the DOL. NIOSH can also award grants to outside researchers such as professors at universities.

Another section of the law authorized NIOSH to conduct research pertinent to OHP. The law authorized research on job stress along with research on exposures

NIOSH facility in Morgantown, West Virginia. (Photographer unknown. Courtesy of NIOSH/CDC. Public Domain.)

to physical hazards: "the Secretary of Health and Human Services shall conduct and publish industry-wide studies of the effect of chronic or low-level exposure to industrial materials, processes, and stresses on the potential for illness, disease, or loss of functional capacity in aging adults." The law authorized NIOSH to support research on psychological factors that can be employed to improve worker safety and reduce accidents, including the modification of behavior and work habits (Cohen & Margolis, 1973).

J. Donald Millar, a physician who had become well known for his work for the CDC on the eradication of smallpox in Africa, became the director of NIOSH in 1981 (Fox, 2015). In the United States in the 1980s, the Social Security Administration saw the growth of disability claims for work-related psychological disorders (Sauter & Hurrell, 2016). While at the helm of NIOSH, the organization developed a list of the 10 leading work-related diseases and disabilities based on frequency, severity, and preventability; the list included psychological disorders (Millar, 1984). Millar took a leadership role in bringing to bear the weight of the organization in supporting research on work-related psychological disorders and developing a national prevention strategy (Sauter & Hurrell, 1999). NIOSH has gone on to award grants to OHP researchers. NIOSH's intramural research has also included an ambitious lineup of OHP-related studies (Caruso, 2009; Hitchcock, 2008; Murphy, 2002; Nigam, 2007; Streit, Nigam, & Sauter, 2011; Wallin, Considine, & Nigam, 2009).

P–E Fit

NIOSH's commitment to research on psychological factors was borne out in one of the first research endeavors the newly created agency supported, a study of the relation of psychosocial working conditions to physical and mental health (Caplan, Cobb, French, Harrison, & Pinneau, 1975; also see Caplan, 1987). This ISR study involved male

workers in 23 U.S. occupational groups. An element of the study was loosely motivated by Darwinian theory, namely, the importance of the fit between the person and his or her environment. The authors advanced the view that "the goodness of fit" between the "characteristics of the worker" (e.g., needs and abilities) and the requirements of his or her work environment is likely to affect the individual's physical and mental health (p. 15).

Caplan, Cobb, French, Harrison, et al. (1975) were concerned with a methodological trap that would also be of concern to later OHP researchers, specifically, the potential problem that self-report stressor measures may be "contaminated" in that they tap more than one construct. For example, a self-report stressor scale is liable to assess stressors as well as personality dimensions and factors such as anxiety, depression, and job satisfaction, potentially inflating the correlation of the stressor scale with the other variables. Caplan et al. addressed the problem of contamination by employing measures that included bipolar vignettes of individuals in clearly described situations (e.g., "In Tom's job he works on many different tasks which are all in different stages of completion . . . Jim's job requires him to work on one job at a time. . . ." [p. 243]) and then have the worker indicate (a) where his current job fits on the continuum and (b) what kind of job he would like if he were looking for a new position. Although similar vignettes have not been widely used in OHP research, the seriousness of the ISR team's concern with the problem of confounding was a call for care in developing the methods required to study the impact of psychosocial work characteristics on strain, which is often operationalized by psychological symptoms.

An example of a person–environment (P–E) fit stressor is the discrepancy between the amount of complexity a job requires and the amount of complexity a worker prefers. The relation of P–E fit job complexity to depression was, as P–E theory suggested, curvilinear, with both too much and too little complexity related to elevated levels of depressive symptoms. For a period of time, P–E fit was a popular avenue of research, but since the late 1980s, interest in it has waned owing to difficulties specifying mathematical representations of P–E discrepancies and problematic statistical models of the relation of P–E discrepancies and strains (Ganster & Schaubroeck, 1991).

Burnout

Herbert Freudenberger (1974) was the individual who first identified the concept of burnout. Freudenberger admitted to having experienced burnout in the context of working in free clinics. He identified a number of physical signs of burnout that include feelings of exhaustion and fatigue, headaches, gastrointestinal problems, and sleeplessness. He also identified a number of behavioral signs. These signs included the reaction that the slightest pressure makes the individual feel overburdened; another is a suspicious attitude and the feeling that others—clients and colleagues—are out to take advantage of the individual. According to Freudenberger, the most dedicated and committed professionals working in free clinics, crisis intervention centers, and other arenas dedicated to helping people are at risk for burnout. The care the professional gives to a very needy clientele risks depleting the professional's reserves. Christina Maslach's (Maslach & Jackson, 1981; Maslach, Jackson, & Leiter, 1996) efforts to design an instrument to measure burnout helped to accelerate research on the subject. Over time, the concept of burnout has been extended beyond helping professionals to include almost all workers, and even to roles outside of work (Bianchi, Truchot, Laurent, Brisson, & Schonfeld, 2014).

Decision Latitude and Job Demands

Gardell (1971) examined mental health and alienation in a study of Swedish pulp and paper mill workers and engineers. He operationalized alienation in terms of the extent to which a worker "depreciates his work as a source of needs satisfaction" (p. 148). Gardell suggested that the problem of alienation at work was similar in both capitalist and socialist countries, with alienation emanating "from the industrial production system, and the causes should be chiefly sought in the authoritarian system of power and leadership" in the workplace (p. 148). Gardell found that the extent to which the workers exerted control and influence over their work was positively related to mental health and self-esteem, and negatively related to feelings of alienation.

In 1979, Robert Karasek published an article that became very influential in OHP circles. Using two large data sets, he showed the viability of a model in which the combination of low levels of decision latitude (i.e., control over job tasks conducted over the work day) and high levels of job demands adversely affects workers' mental health. The adverse mental health effects are often termed "psychological strains." The job demands component of the model largely comprised psychological workload, and not physical demands. The model was interactional, underlining that the combination of reduced latitude and high workload was particularly toxic for mental health.

Although prior research by Trist and Bamforth (1951) and Gardell (1971) underscored the impact of low levels of job-related autonomy on workplace morale and mental health, Karasek's model stimulated an outpouring of research, including research on both the independent and the interactive effects of decision latitude and workload on psychological symptoms and disorders. Karasek's model has been extended to examine the impact of the two factors on physical health (e.g., Karasek, Baker, Marxer, Ahlbom, & Theorell, 1981). The model was expanded to include another important variable, namely, coworker support (Johnson, Hall, & Theorell, 1989). The model has been a fountainhead of OHP research.

THE 1980S TO THE PRESENT

The rest of the chapter concentrates on institution building. Important organizations emerged during this period. These organizations became hubs for the coalescing of communities of OHP researchers and practitioners. The organizations have provided a network for the communication of OHP-related ideas. Many of the research developments that occurred in this period are covered in later chapters; however, two empirical studies are covered because of their groundbreaking nature. The chapter also examines the coining of the term "occupational health psychology." Having an effective term to subsume the work of researchers and practitioners in this field facilitates communication.

Two Groundbreaking Studies

The studies conducted by Friedman et al. (1958), Kasl and Cobb (1970), and Cobb and Rose (1973) demonstrated that the impact of psychosocial workplace characteristics on physical health could be rigorously studied. In a similar vein, two later studies demonstrated that the impact of psychosocial workplace characteristics on mental health could also be rigorously studied.

Katherine Parkes (1982) exploited a "naturally occurring work situation" involving female student nurses in the United Kingdom who were randomly assigned to different rotations (see the section on natural experiments in Chapter 2). One rotation group began in the surgical ward and ended in the medical ward; the other group rotated through the wards in the reverse order. Working in medical wards, with their "greater affective demands," was linked to markedly higher levels of depressive symptoms and lower levels of work satisfaction.

In the second study, Michael Frese (1985) followed male German industrial workers, using both subjective ratings of job stressors (e.g., ambiguities, conflict) and group-averages based on the ratings of three or more individuals doing the same job (but not necessarily working together). Controlling for psychosomatic symptoms (e.g., headaches, stomachaches) at baseline, baseline workplace stressors significantly predicted psychosomatic symptoms 16 months later. Reverse causality, a situation in which symptoms cause the hypothesized stressors, is difficult to rule out in cross-sectional studies, the most common type of study (see Chapter 2). In a test of a reverse causal hypothesis, symptoms at time 1, controlling for job stressors at time 1, failed to predict job stressors at time 2.[6]

Occupational Health Psychology

Although they did not use the term "occupational health psychology," Cooper and Marshall, in 1976, called for psychologists who conduct research on job stress to collaborate with other social scientists and medical professionals to advance what is essentially an interdisciplinary field. The term "occupational health psychology," first appeared in print in 1985 and 1986. In 1985, Robert Feldman, in a chapter in a book on workplace health promotion, a book that he and George Everly, Jr. edited, emphasized the need for interdisciplinary teamwork in health promotion: "Industrial hygienists, occupational physicians, occupational health psychologists, and occupational health educators all have a role to play to reduce and eliminate injuries and illnesses" (p. 286). Feldman also indicated that occupational health promotion and occupational health psychology share a role in improving workers' perceptions of risk and changing risky behavior in workers.

In 1986, George Everly, Jr., in an annual series on clinical practice, more fully acquainted readers with the term in an article entitled *An Introduction to Occupational Health Psychology*. Everly viewed OHP as a subspecialty of the older field of health psychology. For Everly, OHP involved the application of psychological theory and knowledge to prevent, diagnose, and treat "physical disease and dysfunction" that arise from workplace conditions. He was careful to note that workplace health promotion needs to be compatible with the organization's balance sheet, and went on to describe a systems approach to workplace health promotion that includes greater collaboration between an organization's health professionals and management. Everly

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[6] One limitation of the study was that independent, expert-based objective ratings of stressors at time 1 failed to predict time 2 psychosomatic symptoms although such a finding does not impeach the main results because two different kinds of observers conducted the time 1 and time 2 objective ratings (engineers, psychology students). Because of imprecision in the objective measures of job stressors, correlations between objective measures and strain represent a kind of "lower bound of the true correlation" (p. 325). The imprecision reflects the fact that the raters, in the relatively short time (at most an hour and a half) they had to observe each of the various positions, imperfectly captured the job stressors an individual worker encountered in his lived workplace experience.

also suggested that for OH psychologists, training include counseling or clinical psychology, "industrial psychology," biomedical preparation, and public health.

The next time the term would appear in a publication was in 1990. Raymond, Wood, and Patrick published a paper in the *American Psychologist*, a journal received by every member of the American Psychological Association (APA). The authors enunciated the view that psychologists have an obligation to ensure healthy work environments. Raymond et al. (1990) called for doctoral-level training in OHP, training that would be strongly interdisciplinary. Unlike Feldman and Everly, Raymond et al. were concerned with training that would enable psychologists to deal with disorders arising from work-related stress.

Work & Stress

Journals are an important vehicle for communication in science. In 1987, Tom Cox and Phillip Dewe of the University of Nottingham founded the first journal devoted to OHP-related topics (Cox, 2011). At the time of its founding, the journal did not use the term "occupational health psychology," for the term had not yet had wide currency. Cox named the journal *Work & Stress*. The name of the journal is telling because "interest in work-related stress was accelerating and the contents of the first volumes reflect the fact that the main interest in those years was on that specific subject" (Cox, Taris, & Tisserand, 2009, p. 17). In the 1990s, as the field of OHP widened, the journal began to expand its focus beyond workplace stress (Cox et al., 2009), publishing papers on the relation of psychosocial working conditions to musculoskeletal symptoms, the relation of learning opportunities to decision-authority, organizational factors that affect accident risk, and so on.

APA–NIOSH Conference Series

With NIOSH supporting the addition of psychological disorders to its portfolio of work-related disorders, a number of scientists at NIOSH in the late 1980s made common cause with the APA. The prevention of work-related psychological disorders was on the agenda of a 1986 symposium sponsored by NIOSH (Quick, Murphy, & Hurrell, 1992). In 1989, individuals at NIOSH (Steven Sauter, Joseph J. Hurrell, Jr., and others) and APA (Gwendolyn Keita, Heather Roberts Fox, and others) began a collaboration that included planning for the APA/NIOSH Work and Well-Being Conference that would be held the next year in Washington, DC. J. Donald Millar, the then-director of NIOSH, approved funding to help underwrite the cost of the conference (Sauter & Hurrell, 2016). This international conference included panels of interdisciplinary experts on "stress and job design, the surveillance of occupational stress and psychological disorders, and enhancing occupational mental health" (Quick et al., 1992). Conferences were also attended by industrial/organizational, experimental, and developmental psychologists, physicians, nurses, social workers, human resources personnel, economists, and labor leaders. In the beginning, the conferences ran every 2 to 3 years, but by 2006, the conference series became biennial. The conferences provided a congenial setting for OHP professionals to get to know one another and to get to know each other's work.

Doctoral Programs in OHP

In order for OHP to sustain itself, a flow of new researchers and practitioners into the field was needed. APA and NIOSH collaborated in a new way; they began to

provide seed money to help underwrite the creation of postdoctoral programs in OHP. Leaders in the two organizations, however, soon acknowledged that the best route to bringing more professionals into the field was to support doctoral training in OHP (Hammer & Schonfeld, 2007). At the time of the writing of this book, there are 11 OHP graduate programs in the United States.

University of Nottingham

In 1988, through a merger of two research groups, Tom Cox helped found the Centre for Organizational Health and Development (COHD) at the University of Nottingham (Leka, 2016 and personal communication, April 2016). Through a later merger and name change and a reemergence under its original name, the Centre has played an important role in research, practice, and policy bearing on the management of psychosocial risk in workplaces (Leka, 2016). In 1996, Cox developed a curriculum for an OHP master's program at the University of Nottingham. It was the first master's degree program of its kind. The founding of the program was consistent with the call by Raymond et al. (1990) for the training of psychologists in the science needed to ensure healthy work environments. Today the University of Nottingham offers a doctorate in Occupational Health—Psychology and Management.

Journal of Occupational Health Psychology

In the context of their organization's efforts to develop a strategy for prevention of work-related psychological disorders (NIOSH, 1988), two NIOSH researchers, Steven Sauter and Joseph J. Hurrell, Jr., together with NIOSH colleagues, conceived of a new kind of journal devoted to work, stress, and health. After several years of exploratory and developmental effort, Sauter and Hurrell invited James Campbell Quick of the University of Texas, Arlington, to serve as the first editor. The three worked collaboratively with Gary VandenBos of APA's Publications Office to establish the *Journal of Occupational Health Psychology (JOHP)* (Hurrell & Sauter, personal communication, May 2013, September 2016; Quick, 2010). NIOSH funding helped underwrite the journal's start-up costs. APA published the first volume in 1996. Like *Work & Stress*, *JOHP* has had an international presence, with contributors from many different countries.

ICOH–WOPS

A goal of the International Commission on Occupational Health (ICOH), an important international organization founded in 1906, has been to ensure progress toward safer and healthier workplaces. In 1993, the organization began to concern itself with OHP. ICOH formed a preliminary working committee devoted to understanding work organizations and psychosocial factors (S. Leka, personal communication, April 1, 2014). In 1996, the organization formally founded the 35th of its 35 scientific committees, the Scientific Committee on Work Organisation and Psychosocial Factors (WOPS). The goals of ICOH–WOPS include exchanging, accumulating, and disseminating "information relevant to psychosocial factors at work and health among workers, and also to facilitate research and practice in the field" (Kawakami, 2009, p. 9). Beginning with its inaugural conference in Copenhagen in 1998, ICOH–WOPS has organized a triennial conference series on psychosocial factors in the workplace.

European Academy of Occupational Health Psychology

In 1997, representatives of the University of Nottingham and representatives of two departments of occupational medicine in hospitals in Denmark, Skive Syghus and Herning Syghus, completed the preparatory work needed for the convening of a committee, the purpose of which was to lay the foundation for an international body devoted to research, practice, and teaching in OHP (European Academy of Occupational Health Psychology, 1999; Houdmont, 2009). That international body, the European Academy of Occupational Health Psychology, was formally founded in 1999. Within a year, the EA-OHP was headquartered at the Institute of Work, Health & Organisations at the University of Nottingham and led by Tom Cox.

The organization helped to advance research, teaching, and practice in OHP by creating working groups in each domain (Houdmont, 2009). In 2000, the Academy became the home of the journal *Work & Stress*. The EA-OHP organized a conference series that became biennial. In 2004, Paul Flaxman, Joanna Pryce, and Fehmidah Munir published the Academy's first newsletter, the purpose of which has been to report on research and practice and keep the readers up to date on organizational news. The organization also created an Internet listserv to help members get in touch with each other for the purpose of sharing information and providing research and practice advice. In 2009, the EA-OHP initiated a book series, *Contemporary Occupational Health Psychology: Global Perspective on Research and Practice*, devoted to reviews and empirical research.

Society for Occupational Health Psychology

As mentioned earlier, beginning in 1990, APA and NIOSH organized what turned into an international conference series devoted to work and well-being. A sentiment that emerged among individuals attending the APA/NIOSH conferences was that it was important to identify "ways of growing the field" (Hammer & Schonfeld, 2007). A series of meetings devoted to the subject were held between 2001 and 2004. Meeting participants discussed plans for creating an organization in the United States that would be devoted to advancing OHP. In 2004, at the APA's offices in Washington, DC, the Society for Occupational Health Psychology (SOHP) was founded and its first officers elected (Hammer & Schonfeld, 2007). Leslie Hammer of Portland State University was named the first president of SOHP.

SOHP provides members with resources pertaining to research, practice, and teaching. In 2006, the Society assumed a role together with APA and NIOSH in organizing the, by then, biennial conference series on work, stress, and health. In 2008, SOHP began to coordinate benefits with EA-OHP. The two organizations arranged the conference series to take place in alternate years. In 2006, although still published by APA, *JOHP* became associated with the Society. The Society, together with APA, developed a listserv to help members communicate with each other. In 2007, SOHP began a newsletter under the editorship of Irvin Schonfeld. The newsletter serves multiple purposes including communicating organization-related news to members, publishing OHP-relevant articles of general interest (e.g., innovative statistical applications, the impact of economic downturns), showcasing graduate programs in OHP, and publishing articles on the history of OHP. In 2017, SOHP will have taken an even bigger step, and, under the editorship of Robert Sinclair, begin to publish a new journal, *Occupational Health Science*.

Contributors to the APA/NIOSH/SOHP Work, Stress, and Health Conference in 2006 in Miami. From left to right Peter Chen, Robert Sinclair, and Leslie Hammer. (Photographer, Irvin Sam Schonfeld.)

We make one additional observation that bears on both EA-OHP and SOHP is worth noting. This observation underlines something important about OHP, namely, the interdisciplinary character of OHP research. Although most of the organizations' members come from psychology, both organizations welcome members from disciplines outside of psychology because those members, like their psychologist brethren, contribute to OHP research. EA-OHP has had a president who is a physician.

SUMMARY

OHP is concerned with the relation of workplace psychosocial characteristics to the physical and psychological well-being of people who work. The reader of this chapter can follow the development of the OHP from its forerunners to the emergence of organizations that sustain the field. The chapter began with a celebrated poem that reflected on the physical and spiritual impact of the Industrial Revolution in England. Engels's (1969/1845) work on the physical effects of industrialization on workers was underlined. Marx (1967/1844) employed the multilayered concept of alienation to describe the psychological impact of industrial capitalism on workers. Durkheim (1951/1912) linked upward and downward changes in the business cycle to suicide risk. Weber (1993/1904–1905) observed how work, which was once thought of as a calling, turned on itself, and became what for many individuals is an "iron cage." The early 20th century saw the rise of Taylorism and Fordism with their focus on efficiency. Taylorism and Fordism became associated with dictatorial methods of improving workplace efficiency (Cruden, 1932; Hughes, 1989; Linder & Nygaard, 1998; Nolan, 1997; Wallace, 2003) although Taylorist research helped spur the use of rest periods as a means to improve productivity. In the context of the Hawthorne study, Taylorist research gave way to concerns about the impact on workers

of psychosocial aspects of the workplace (Mayo, 1933; Roethlisberger & Dickson, 1939). An Austrian research team led by Marie Jahoda examined the psychological hardships of unemployment. The chapter also examined the psychological impact of combat on soldiers in two world wars (e.g., Stouffer et al., 1949; Swank, 1949).

After World War II, a number of developments emerged from both research and organizational standpoints that contributed to the development of OHP. Research conducted by Trist and Bamforth (1951), Chinoy (1955), Kahn et al. (1964), and Kornhauser (1965) added to research on work and psychological well-being. Selye (1956) provided an impetus for biological research on stress. His research implicated the hypothalamus, adrenal glands, and autonomic nervous system in responding to environmental stressors. Increased interest in worker autonomy and workload emerged (Karasek, 1979). Investigators demonstrated that rigorous methods could be used to study the impact of psychosocial workplace conditions on both physical (e.g., Cobb & Rose, 1973; Friedman et al., 1958; Kasl & Cobb, 1970) and psychological functioning (e.g., Frese, 1985; Parkes, 1982). Between 1985 and 1990, the term "occupational health psychology" began to appear in print (Everly, 1986; Feldman, 1985; Raymond et al., 1990).

After World War II, a number of organizational developments helped sustain research in OHP, including the ISR at the University of Michigan. The Tavistock Institute for Human Relations was founded in 1946. Tavistock researchers and colleagues at MIT launched the journal *Human Relations* in 1947.

In the United States, Public Law 91-596 was passed in 1970, authorizing the creation of OSHA and NIOSH. NIOSH would go on to support OHP-related research. APA and NIOSH organized a series of international conferences, beginning in 1990. The conference series was an important ingredient in getting OHP-oriented researchers and practitioners to know each other. APA and NIOSH began to provide seed money for doctoral programs in OHP. Beginning in 1996, the University of Nottingham pioneered graduate training in OHP in Europe. The journal *Work & Stress* was organized in 1987, and *JOHP* in 1996. ICOH-WOPS was founded in 1996, EA-OHP, in 1999, and SOHP, in 2004.

Like other branches of science, OHP was built on research efforts that antedate the founding of the discipline. The field has since become an established specialty within psychology, but with interdisciplinary currents. It is represented by dedicated journals and has organizational support.

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