

KURT GOLDSTEIN AND THE NEUROLOGY OF MOVEMENT DURING THE INTERWAR YEARS

Physiological Experimentation, Clinical Psychology and Early Rehabilitation¹

Frank W. Stahnisch / Thomas Hoffmann

[...] a pseudo-social organization may be compared with an organism in disease, and we may speak of such a society [in which the normal relations are no longer sustained] as sick. Normal society means a type of organization through which the fullest possible actualization on the part of all individuals is assured. [...] If we acknowledge and utilize social organization as an instrument by means of which all individuals may actualize themselves to an optimal degree, then a genuine social life becomes possible. Only under these conditions is a social organization capable of doing justice to every individual; only this makes it a real organization and secures its duration. [...] Only in this way can we discover the concrete causes of failure in a given situation and the appropriate ways to correct the failure.²

-
- 1 Both authors are grateful for the editorial assistance of Mrs. Beth Cusitar who proofread and adjusted the English language of the paper manuscript. Frank W. Stahnisch further wishes to thank the Hotchkiss Brain Institute and the Calgary Institute for Population and Public Health for their support of this research project.
 - 2 The citation is taken from Kurt Goldstein's Harvard lecture series, published in the middle of WWII as: Kurt Goldstein: Human Nature in the Light of Psychopathology, Cambridge, MA 1940, p. 222f.

1. Introduction

The initial citation is taken from the “William James Lectures”, which German émigré-neurologist Kurt Goldstein (1878-1965) gave at Harvard University between 1937 and 1938, after having been invited by its Department of Education. As much as it represents his own experiences as a Jewish refugee in Switzerland, Holland and finally the United States, it can also be seen as an embodiment of his early views as a rehabilitation specialist in neurology and psychiatry.³ As we aim at showing in this paper, a major incentive for Goldstein’s work with injured veteran soldiers after World War One originated from his intention to reach at their full reintegration into a functional social “organism”. This primary aim of realizing “the fullest possible actualization on the part of all individuals” was likewise exemplified by Goldstein’s clinical approaches to restore full body movement, psychological comfort and the proper functional use of the newly developed prostheses (see Fig.4) in Goldstein’s neurological research program. It does not come as a surprise that Goldstein deliberately compares the functioning of types of “social organization” with the physiological action and movement of the human body itself.⁴ Goldstein’s views on restoring the disabled body’s functionality and the reintegration of the war-injured back into society, of course, was not really a new thought in the history of medicine, nor was it even revolutionary with regard to Goldstein’s particular subject of “Human Nature in the Light of Psychopathology”.⁵ At Harvard, the protagonist of holist neurology spoke mainly in front of an audience interested in general questions of clinical psychology, patient education and rehabilitation,

-
- 3 Cf. Yehuda Ben-Yishay et al.: Kurt Goldstein’s Holistic Ideas – An Alternative, or Complementary, Approach to the Management of Traumatically Brain-injured Individuals. In: *US Neurology* 4 (2008), I. 1, pp. 79-80.
 - 4 For comparison with Goldstein’s position, see the French experimental physiologists of the later 19th century, in: Elizabeth A. Williams: *The Physical and the Moral. Anthropology, Physiology, and Philosophical Medicine in France, 1750-1850*, Cambridge 1994, pp. 196-232, or the German theoretical pathologists following Rudolf Virchow’s (1821-1902) tradition in: Renate Wittern: “Die Politik ist weiter nichts, als Medizin im Grossen” – Rudolf Virchow und seine Bedeutung für die Entwicklung der Sozialmedizin. In: *Verhandlungen der Deutschen Gesellschaft für Pathologie* 87 (2003), pp. 150-157.
 - 5 Goldstein had alluded to this trope on a number of earlier occasions: Kurt Goldstein: *Die Neuroregulation. Referat*. In: *Verhandlungen der Deutschen Gesellschaft für Innere Medizin* 43 (1931), I. 1, pp. 9-13; *Das psychophysische Problem in seiner Bedeutung für ärztliches Handeln*. In: *Therapie der Gegenwart* 72 (1931), I. 1, pp. 1-11.

with only few participants attending from the medical community.⁶ They came to hear Professor Goldstein explaining his research on the eve of one of human history's most severe catastrophes: the Second World War. While presenting, the illustrious émigré-intellectual zealously reflected back on his own medical experiences during WWI, which served him as a *folio* to compare the new and devastating political developments.

In this paper, we want to focus on Goldstein's rehabilitative views regarding the restoration of complete function and movement of the war-injured patients and later their reintegration into the work force to lead a functional social life. In the first step, we present Goldstein's biographical background in the culturally diversified Silesian city of Breslau, his work at the Frankfurt Institute of Neurology, and his later experiences as the chief of neurology in the Berlin hospital of Moabit. In a second step, we want to characterize his neurological work on the restoration of movement and patient rehabilitation between the end of WWI and the Interwar Period. In this step we discuss his views on physiological experimentation, clinical psychology and early rehabilitation in the light of the political events and his emigration to America. Needless to say, Goldstein has already been the subject of much historiographical research with regard to his neurological theory, the advancement of clinical psychology, and the importance of his neuroscientific group for a "holist tradition" in Weimar Germany.⁷ Nevertheless, the available research literature does not sufficiently reflect the immense influence he exerted on various other fields, such as philosophy, Gestalt and experimental psychology, or psychosomatics. What we would particularly like to propose is a methodological revision of the question of movement and rehabilitation in this German émigré-physician, by asking about the specific interdisciplinary organization of his research programs. Indeed, Goldstein and his group cannot be reduced to a straightforward neurological approach. They fervently drew on philosophical, psychoanalytic, experimental

6 See also the assessment of MIT psychologist Hans Lukas Teuber (1916-1977), who helped to make Goldstein's Harvard visit possible: Hans L. Teuber: Kurt Goldstein's role in the development of neuropsychology. In: *Neuropsychologia* 4 (1966), I. 4, pp. 299-310, esp. p. 308.

7 See related historiographical approaches in psychology, Mitchell G. Ash: *Gestalt psychology in German culture, 1890-1967. Holism and the quest for objectivity*, Cambridge 1995; in biology, Jonathan Harwood: *Styles of Scientific Thought. The German Genetics Community 1900-1933*, Chicago 1993; or in holist neurology, Anne Harrington: *Die Suche nach Ganzheit. Die Geschichte biologisch-psychologischer Ganzheitslehren: Vom Kaiserreich bis zur New-Age-Bewegung*, Reinbek bei Hamburg 2002.

psychological, social and neurophysiological work which they combined in a productive and unique manner with neurorehabilitation.⁸

2. Goldstein's biography

Kurt Goldstein's (1878-1965) biography and the course of his innovative clinical research work have passed through a number of distinctive phases: We refer here to his becoming the successor to Ludwig Edinger (1855-1918) as the director of the Frankfurt Neurological Institute in 1918 and the start of his important pioneering work with head injured WWI soldiers.⁹ Later on, when Goldstein accepted the directorship of the Neurological Clinic at the Berlin City Hospital of Moabit – in 1930 –, he established a multidisciplinary research and patient care model which incorporated integrative services of neurology, clinical psychology, neuropathology, and histological research. This organizational structure also necessitates taking another look at the Frankfurt and Berlin group of collaborators, contributors and discussants¹⁰ – such as Max Wertheimer (1880-1943), Wolfgang Koehler (1887-1967) or Kurt Lewin (1890-1947)¹¹ – for a better understanding of the interdisciplinary nature of the work of Kurt Goldstein and his group in Germany during and after WWI.

8 Recent work in the history of medicine and science has made us aware of the important influence of interdisciplinary trends and their cultural groundings in situational, local, and even national contexts. See, for example, D. Heward Brock et al. (eds.): *The Culture of Biomedicine*, Newark, London 1984; Peter Galison et al. (eds.): *Science in Culture*, New Brunswick, NJ, London 2001; Henning Schmidgen et al. (eds.): *Kultur im Experiment*, Berlin 2004. Similar influences can also be found in the interdisciplinary programs of 20th century brain science, such as in Kurt Goldstein and his neurorehabilitative research group.

9 Cf. also: Frank Stahnisch: Ludwig Edinger (1855-1918) – Pioneer in Neurology. In: *Journal of Neurology* 255 (2008), I. 1, p. 147-148, esp. p. 148.

10 See, for example, in: Udo Benzenhöfer et al.: *Bemerkungen zur Frankfurter Zeit (1917-1933) des jüdischen Neurologen und Psychiaters Walther Riese*. In: *Schriftenreihe der Deutschen Gesellschaft für Geschichte der Nervenheilkunde* 3 (1997), I. 1, pp. 31-40; or: Thomas Plänkner et al. (eds.): *Psychoanalyse in Frankfurt am Main. Zerstörte Anfänge. Wiederannährung. Entwicklungen*, Tübingen 1996.

11 Thomas Hoffmann: *Psychische Räume abbilden – Kurt Lewins topologische Psychologie und ihr Beitrag zu einer dynamischen Theorie geistiger Behinderung*. In: Frank Stahnisch et al. (eds.): *Bild und Gestalt: Wie formen Medienpraktiken das Wissen in Medizin und Humanwissenschaft?* Münster u. a. 2007, pp. 75-98, esp. p. 76.



Fig. 1: Kurt Goldstein during his visit to Israel in 1958; photograph courtesy of Dr. Moshe Feinsod

Goldstein's biography had been far from typical: Born into a Jewish mercantile family in the German province of Lower Silesia, he was educated at the integrative Jewish high school of Breslau, before studying philosophy at the University of Heidelberg.¹² Owing to the strong influence of his father who did not regard philosophy as an adequate field of study for his son, Goldstein changed his plan and began to study medicine at the University of Breslau, where he graduated as an M.D. in 1903. By now, having gained his doctoral thesis from the Psychiatric Clinic of Carl Wernicke (1848-1904) – one of the most renowned psychiatric and neurological diagnosticians in Germany –, his interests had been set. Adding to his theoretical preoccupation with psychiatry and neurology, previous philosophical inspirations now crept into his medical work “through the back door”: The cultural philosopher Ernst Cassirer (1874-1945) – who later fled Germany for England, Sweden, and the U.S. – was to become his brother in law and exerted a strong influence on him. This specifically reflected the latter's analysis

12 Wolfram Belz: Kurt Goldstein (1878-1965) – Lebens- und zeitgeschichtliche Hintergründe. In: Gerhard Danzer (ed.): Vom Abstrakten zum Konkreten. Leben und Werk Kurt Goldsteins (1878-1965), Frankfurt/M. 2006, pp. 11-70.

of the cultural context of scientific thought and the intricate interplay of “form” and “function” that Cassirer had so thoroughly analyzed in physics, biology, and the arts.¹³ Between 1906 and the outbreak of WWI, Goldstein completed his residency at the University of Königsberg in East Prussia where he graduated for a second time with a Habilitation thesis in neurology.

From there, the eminent neuroanatomist Ludwig Edinger became aware of Goldstein’s exacting work on the aphasias and language disorders following brain injuries particularly those of the cortex. He offered Goldstein the directorship of the Institute for Research into the Effects of Brain Lesions (“Institut für die Erforschung der Folgeerscheinungen von Hirnverletzungen”). It was a clinical subdivision of the Neurological Institute which in 1914 – shortly before the outbreak of the Great War – became annexed to the newly established bourgeois University of Frankfurt am Main.¹⁴ At this institute, Goldstein joined Adhémar Gelb (1887-1936) who became his closest collaborator for many years.¹⁵ In 1929, Goldstein was even designated as Edinger’s successor in the multidisciplinary Frankfurt Institute for Neurology but was not granted a proper psychiatric clinical ward. The Faculty had divided the service, and the directorship for the psychiatric clinic was solely given to Karl Kleist (1879-1960), becoming an everlasting disappointment to him.¹⁶

As a result, in 1930 Goldstein left for Berlin where he accepted the directorship of the Clinic for Neurology at the Charité teaching hospital of Berlin Moabit.¹⁷ In the period that followed, Goldstein appeared to be very deliberate and fortunate in his choice of a group of very accomplished and innovative experts: Between 1931 and 1932, the Bavarian-Jewish neurohistologist Karl Stern (1906-1975) had already served in the Frankfurt hospital and now has agreed to join Goldstein again, this time coming from the German Research Institute for Psychiatry in Munich. The basic and clinical research facilities of Moabit Hospital

13 Uta Noppeney: *Abstrakte Haltung – Kurt Goldstein im Spannungsfeld von Neurologie, Psychologie und Philosophie*, Würzburg 2000, pp. 144-153.

14 Gerald Kreft: *Deutsch-jüdische Geschichte und Hirnforschung. Ludwig Edingers Neurologisches Institut in Frankfurt am Main*, Frankfurt/M. 2005, pp. 223-283.

15 See further in: Ash, *Gestalt Psychology in German Culture*, pp. 263-275.

16 Klaus-Jürgen Neumärker et al.: *Karl Kleist (1879–1960) – A Pioneer of Neuropsychiatry*. In: *History of Psychiatry* 14 (2003), I. 4, pp. 411-458.

17 Frank Stahnisch: *Transforming the Lab: Technological and Societal Concerns in the Pursuit of De- and Regeneration in the German Morphological Neurosciences, 1910–1930*. In: *Medicine Studies* 1 (2009), I. 1, p. 41-54, esp. pp. 50-52.

soon developed into one of the most promising general city hospitals in the country with Moritz Borchardt (1868-1949) – a pupil of Ernst von Bergmann (1833-1907) – as a versatile neurosurgeon, the experimental psychologist Adhémar Gelb – who had come with Goldstein from Frankfurt –, and before long even Ludwig Pick (1868-1944) – serving as neuropathologist to this group.¹⁸

Goldstein clearly had plans to expand the facilities at Moabit into an institution that organically represented his idea of a holistic approach to the neurosciences.¹⁹ However, just everything was institutionally “set” for Goldstein’s clinic to develop into one of the major centres of German neurology, the Nazi party seized power on January 30th, 1933. One of its first steps was to implement the “Law on the reestablishment of a professional civil service”, determining that all state officials – understood as being “of non-Arian descent” – had to be dismissed from office. Nazi ideology regarded it as unacceptable, if “Arians” were taught by Jews, so that university professors, teachers and doctors in the public health service lost their primary positions. As a result, the law cut deeply into the earlier developed culture of science and medicine of Weimar Germany.²⁰ The director of Moabit City Hospital, the internist Georg Klemperer (1865-1946) – brother of the Dresden novelist Victor Klemperer (1881-1960) and personal physician to the Russian leader Wladimir Iljitsch Lenin (1870-1929) – was convinced that their “reddish” and “Jewish” hospital figured as a primary target for Nazi aggression. Klemperer had been very sensitive to the attacks of Nazi writers in an article from March 21st, 1933 in the party organ “Der Stürmer”, which vividly attacked Goldstein for being a Jewish physician in a high medical position, a psychoanalyst, and a neurologist whose primary concern was for the use of therapy rather than the exclusion of the psychiatric and neurological ill.²¹ From their perspective it was true: The Moabit Hospital was a

18 Frank Stahnisch: *Psychiatrie und Hirnforschung: Zu den interstitiellen Übergängen des städtischen Wissenschaftsraums im Labor der Berliner Metropole* – Oskar und Cécile Vogt, Korbinian Brodmann, Kurt Goldstein. In: Helmchen, Hanfried (ed.): *Psychiater und Zeitgeist. Zur Geschichte der Psychiatrie in Berlin*, Berlin 2008b, pp. 76-93, esp. 88 f.

19 Regarding some of Goldstein’s collaborators, see also in: Frank Stahnisch: *Zur Zwangsemigration deutschsprachiger Neurowissenschaftler nach Nordamerika: Der historische Fall des Montreal Neurological Institute*. In: *Schriftenreihe der Deutschen Gesellschaft fuer Geschichte der Nervenheilkunde* 14 (2008c), I. 1, pp. 414-442, esp. 419-421.

20 Michael I. Shevell: *Neurosciences in the Third Reich: from Ivory Tower to Death Camps*. In: *The Canadian Journal of Neurological Sciences* 26 (1999), I. 2, pp. 132-138, esp. pp. 132-134.

21 Cf. Marianne L. Simmel: *Kurt Goldstein 1878-1965*. In: Marianne L. Simmel (ed.): *The reach of mind. Essays in the memory of Kurt Goldstein*, New York 1968, pp. 1-10, esp. p. 9 f.

stronghold of social activism in the so-called “Red Wedding District”, with 70 % of its medical doctors being of Jewish origin – as seen by Nazi race laws – and 10 % of the nursing staff organized in the socialist unions.

Klemperer had immediately warned Goldstein, obviously having seen the continual beatings of communists and socialists in the street fights, many of whom were brought in the hospital’s emergency room. Unfortunately, Klemperer’s clairvoyance was absolutely right! Goldstein’s incarceration followed soon after April 1st, being discovered while on call and examining his patients. Following the recollections of his organizational assistant Edith Thurm, Goldstein had asked the Storm-Troopers whether he could hand his patients over to his staff attending physician, before accompanying them, however the response was yelled: “Everyone can be replaced – you too!”²² Because he was a prominent member of the “Union of Socialist Physicians”, Goldstein became tortured in the Berlin prison for state enemies in General-Pape-Street. Only through the help of his former student Dr. Eva Rothmann (1878-1960), who later became his wife, the Nazi psychoanalyst Matthias Heinrich Goering (1893-1945?) intervened. Goldstein was released from prison that same year, but had to sign that he left Germany forever.²³ Through Switzerland, where he co-founded the “Union of German Scientists in Despair” (“Notgemeinschaft der Deutschen Wissenschaft”) with the catholic Mainz novelist Carl Zuckmeyer (1896-1977), Goldstein eventually found refuge in the Pharmacological Institute of Amsterdam. It was in Holland where he finalized his seminal publication “The Architecture of the Organism” (“Der Aufbau des Organismus”) with the assistance of the Rockefeller Foundation’s fellowship program for “displaced scientists”.²⁴

22 Harrington, *Die Suche nach Ganzheit*, p. 164 f.

23 Simmel, Kurt Goldstein, p. 9 f.

24 Kurt Goldstein: *Der Aufbau des Organismus: Einführung in die Biologie unter besonderer Berücksichtigung der Erfahrungen an kranken Menschen*, Den Haag 1934.

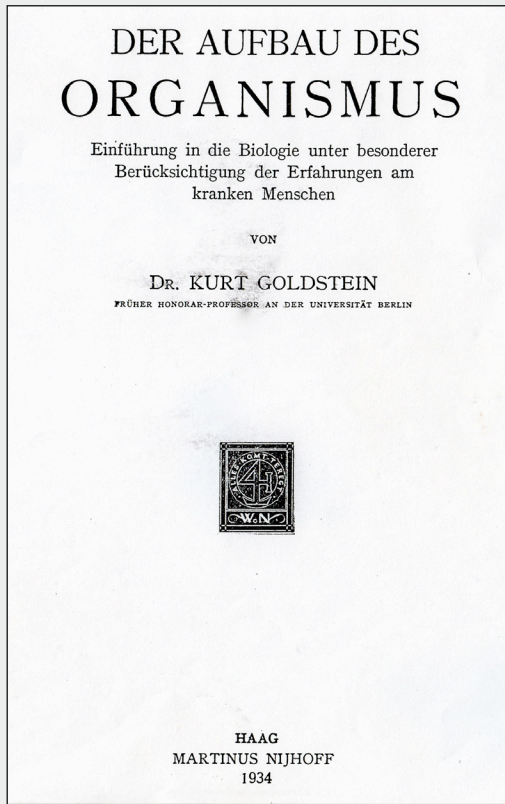


Fig. 2: Goldstein's magnum opus „Der Aufbau des Organismus“

In 1935, Goldstein reached New York and continued clinical work as a neurologist in his private practice and lectured at Columbia University until the end of the war. At the same time as other German-émigrés – such as the social philosophers Max Horkheimer (1895-1973) and Erich Fromm (1900-1980) – he pursued sociopsychological studies on the “authoritarian character” at the New School of Social Research until his death in 1965.²⁵

25 Kurt Goldstein: Autobiography, ed. by Walter Riese. In: Walter Riese et al. (eds.): A history of psychology in autobiography, New York 1967, vol. 5, pp. 145-166.

3. Goldstein's Rehabilitation Work

"My [Goldstein's] idea was to build an institution which offered the opportunity to observe the patients' everyday behaviour and to study them in all respects. Accordingly I organized in Frankfurt am Main, under the administration of the government, a hospital which consisted of a ward for medical and orthopaedic treatment, a physiological and psychological laboratory for special examination of the patients and theoretical interpretation of the observed phenomena, a school for retraining on the basis of the results of this research, and finally workshops in which the patient's aptitude for special occupations was tested and he [the patient] was taught an occupation suited to his ability. I was assisted in this work by younger neurologists, teachers, and psychologists. [...]"²⁶

The life and work of Kurt Goldstein, as stated above, have already been the subject of much historiographical research with respect to the range of neurological theory, the advancement of clinical psychology, and the importance of the research group for forming a "holist tradition" in Weimar neuroscience.²⁷ Yet, the available research literature is relatively silent with respect to the immense, often sub-cutaneous influences that group members exerted on various other fields, such as philosophy, the Gestalt theory and experimental psychology, or psychosomatics:²⁸

It was primarily through the close conjunction of Goldstein the neurologist with Gelb the psychologist that neuropsychology flourished in the Frankfurt Institute. The deep friendship between the two men is a testimony to their character. They were magnificently complementary in training and temperament, each capable of transmitting to the other much of his special skill. Their collaboration exemplifies

26 Taken from: Kurt Goldstein: Notes on the Development of my Concepts. In: Aron Gurwitsch et al. (eds.): Kurt Goldstein. Selected Papers, The Hague 1971, pp. 1-15, esp. p. 3.

27 See, for example, Claude Debru: Georges Canguilhem: Science et non-science, Paris 2004, pp. 49-63, or: Uta Noppeney: Kurt Goldstein – A Philosophical Scientist. In: Journal of the History of the Neurosciences 10 (2001), I. 2, pp. 67-78.

28 These intellectual under-currents were certainly not just effected by the forced-migration of many members of the group, but were already tangible in their local Frankfurt and Berlin working milieus, such as in the exchanges about speech and behavioural problems Karl Landauer (1887-1945) at the Frankfurt Psychoanalytical Institute or with Albrecht Bethe on brain plasticity, the Professor Ordinarius for Physiology and near colleague at the Medical Faculty. Hans-Joachim Rothe: Ein exemplarisches Schicksal: Karl Landauer (1887-1945). In: Plänkners, Thomas et.al. (eds.): Psychoanalyse in Frankfurt am Main. Tübingen 1996, pp. 87-108.

the division of labour which occurs even in the smallest social system [...]: Goldstein had much the firmer grasp of general neurology together with clinical intuition and a sense for broad questions; he found it easy to write, while Gelb was more of the experimenter [...].

It is remarkable how the relationship between these two men remained free from the strains of diverging orientations or personal ambition; their partnership ended only with Gelb's premature death in 1935 when he and Goldstein had just left Germany for Holland where they were jointly awaiting their U.S. visas which were to bring them to America on Rockefeller fellowships.²⁹

Through emphasizing interdisciplinary exchanges in the neuroscience of the Goldstein Group, it becomes possible to study the psychological, philosophical and neurological exchanges in an in-depth manner.³⁰ Clearly, the First World War marked a decisive watershed also for the practice of neurology in the 20th century. Where Berlin neurologist Hermann Oppenheim (1958-1919) for a long-time had been the only prominent advocate of the view that structural neural changes underlay many war-related traumata, only at the end of the war many up and coming neurologists hopped on this band wagon and helped to create a new research program of neuro-traumatology specifically addressing regenerative plastic phenomena in the brain: Kurt Goldstein, Albrecht Bethe (1872-1954) and Max Bielschowsky (1869-1940), etc.³¹ In parallel, the search for a "psychopathic constitution" or "degenerative dispositions" of the brain also accelerated after 1919, when it had become clear that neurological and psychiatric conditions in war injured veterans were of a moving, subjective and changing nature.³²

29 Teuber, Kurt Goldstein's role, p. 301 f.

30 For a further elaborated account of the social environment and innovative interdisciplinary exchanges see, for example, in: Donald Levine, Georg Simmel on Individuality and Social Forms, Chicago 1971, esp. pp. 143-149.

31 Cf. Frank Stahnisch: Making the Brain Plastic: Early Neuroanatomical Staining Techniques and the Pursuit of Structural Plasticity, 1910-1970. In: Journal of the History of the Neurosciences 12 (2003), I. 4, pp. 413-435.

32 A very good account of the neurological picture is given in: Jason Crouthamel: Invisible traumas: Psychological wounds, World War I and German society, 1914-1945. PhD Thesis Bloomington, IN 2001, esp. pp. 100-161.

The experience of the “war neurotics” or the “brain cripples” in the social welfare system was in itself traumatic and the adverse experiences of these individuals mirrored the inborn stress of the last years of the German Empire and the new Republic’s health care plans.³³ During most regular medical evaluations in consideration for the pension status, German doctors told the war-disabled that they were social fakers, and physicians would only grudgingly comply with the law to give them a pension. The war neurotics soon became symbols of permanent victimhood and they themselves countered that this was the “Thank of the Fatherland”. Believing that they jeopardized their own struggles to secure pensions in tight economic times, physically disabled veterans dissented and even organized against the mere “war neurotics”. Veterans suffering from physical brain injuries like gun-shot wounds, grenade splinters, or bayonets stings, feared that with their palsies, uncontrollable shaking movements and broken speech, they would also be stigmatized as “hysterics” or “whiners”.³⁴

Clearly, not only the sense for justice and compensation was at stake here, but the German State instituted a quasi ergotherapeutic sense of trust, action, and social recovery through the equation of health with work. Health care administrator Karl Ernst Hartmann (1873-1926?), for example, emphasized in a seminal instruction for welfare offices and evaluating doctors telling them that all disabled veterans and their families should accept the right notion that national healing would come through mutual work efforts and social engagement:

The war wounded and their dependents have suffered exceptionally under the nerve-shattering effects of the world war: their speech, their movements, their ability to feel, their inner being has been fundamentally changed by today’s murderous torments to the body and spirit. [...] It is crucial to convince the individual war wounded and war widows to trust themselves again, to awake in them the will to act, the desire to live and the self-confidence that they are useful

33 A thorough account of the social, economic and rehabilitative implications is given in: Joachim Radkau: *Das Zeitalter der Nervosität. Deutschland zwischen Bismarck und Hitler*, Munich 1998.

34 See also in: Hans-Georg Hofer: War neurosis and Viennese psychiatry in World War One. In: Jenny Macleod et al. (eds.): *Uncovered fields. Perspectives in First World War studies*, Amsterdam 2004, pp. 243-260.

*limbs of the national community and important pieces of the larger economic comradeship [...].*³⁵

War victims – both combat veterans and their families – were depicted as deeply alienated from the basic idea that their work had any meaning and that they were fully reconnected with the new German society. Certainly, this social democratic view of work was in many ways romantic and soon undercut by the economic turmoil that shattered the liberal roots of the Weimar Republic. In a way, the images of men physically tied to their workbenches and machines resonated strongly with the communist philosopher Karl Marx's (1818-1883) prediction that in the future, humans would become nothing more than appendixes to machines. When Sigmund Freud (1856-1939) had lamented at the Wagner-Jauregg (1857-1940) law case that "doctors acted like machine guns behind the trenches", it now became noticed that many neurologists acted like the foreman on the moving assembly lines, just making things function:

*In the brain-injured patient, we encounter changes of structure. Resulting from this, a whole series of earlier and normal action-realizations ["Reizverwertungen"] can no longer be sustained and previous viable tasks no longer resolved. When the patient is confronted with them, however, various abnormal action-realizations occur, which I call the 'catastrophic reactions' ["Katastrophenreaktionen"].*³⁶

As the famous Soviet neuropsychologist Alexander R. Luria (1902-1977) has pointed out, Goldstein tried to combine the analytical approach of classical neuroscience with the holistic theory of the brain and the structural laws of the higher psychological processes in the purpose of contemporary "Gestalt Theory". In contrast to the machine metaphor of the brain and its functioning, current in neurophysiological theory since the turn of the century, Goldstein stated, that the patient's symptom

cannot be regarded as an immediate expression of the damaged function: it has to be analysed, and only an analysis of the basic

35 Karl Ernst Hartmann: Lehrbuch der Kriegsbeschädigten- und Kriegerhinterbliebenen-Fürsorge mit bes. Berücks. d. neuen sozialpolit. Maßnahmen d. Reichsregierung, Berlin 1919, p. 32f.

36 Kurt Goldstein: Ueber das Problem der Angst (1927). In: Kurt Goldstein: Selected Papers/Ausgewählte Schriften (Reprint), The Hague 1971, pp. 231-255, esp. p. 238.

*disturbance which has to be singled out can show its real essence; this basic disturbance can solve the riddle of the whole syndrome – and only when it becomes clear is the clinical analysis of the patient over.*³⁷

His new theory and method was based on the assumption that the nervous system is a network, mediated by ganglia and correlated with the outside world through the sensor and motor functions:

*Every stimulus, which affects this consistent apparatus, this „system“, generates a modification of the whole apparatus. This modification finds its external expression in movements of the target organs. [...] The organism exists only in its own milieu, this means: only those things in the outside world, which are capable to merge with the system of the organism into a more extensive system, get „captured“ by the organism, constitute its milieu. All others actually don't exist. If they enforce access, they affect it as disturbances, which impact either has to be eliminated or leads to severe dysfunctions in the whole system of the organism [...].*³⁸

Luria noticed that this method of the psychological qualification of the syndrome, which Goldstein first introduced systematically in a short paper from 1925, “The symptom, its emergence and meaning for our view of the building and of the function of the nervous system”, could be termed as the beginning of modern neuropsychology. Goldstein himself called his approach retrospective “a kind of philosophical anthropology”.³⁹

The work performed between 1918 and 1930 by Goldstein and his interdisciplinary group at the Institute for Research into the Effects of Brain Lesions is a particularly good example for a closer study of the cultural exchanges and interrelations between neurology and the post-war Republic through integration

37 Alexander R. Luria: Kurt Goldstein and Neuropsychology. In: Neuropsychologia 4 (1966), I. 1, p. 312.

38 Kurt Goldstein: Zur Theorie der Funktion des Nervensystems. In: European Archives of Psychiatry and Neurosciences 74 (1925b), I. 1, pp. 375-376.

39 Kurt Goldstein: Notes on the development of my concepts. In: Goldstein, Selected Papers, p. 12.

of philosophy, social psychiatry, and neuroscientific innovations into the program of “holistic neurology”. It would, however, be construed to regard it as streamlined or a monolithic research tradition as it also displayed many ambiguities even within contemporary neuropathological views:

At that time [mental diseases] were considered the expression of abnormal brain conditions. The study of the nervous system was taken for granted, and I became attracted by professors who were occupied with studies in this field: the anatomist, Professor [Albrecht] Schaper [1863-1905], who was interested in the embryonic development of the nervous system; the famous psychiatrist, Professor Karl Wernicke, who tried to understand the symptoms of the patients psychologically and to combine this understanding with the findings on their brains; and Professor Ludwig Edinger, who laid the foundations of comparative anatomy of the nervous system [...].⁴⁰

These interdependencies of structural anatomical interests with clinical neurological work were significantly interwoven with the cultural discourses of “degeneration” and “exhaustion” – even in Goldstein’s early and rather unknown small monograph on „Racial Hygiene“ (1913). The book, in which it appeared, is revealing of the culture of the Weimar Republic, and it contextualizes neurological and neurobiological thought and practice even though the state of contemporary knowledge was quite demanding:

The reality of intellect, of self-determination, which even in its most primitive form represents essential characteristics of man, dooms to failure any breeding experiment of the usual type. However, if the relation of hereditary conditions aims not at specific characteristics, but aspires to meliorate the human race by eliminating the unfit individuals, such endeavour presupposes a thorough knowledge of the significance of individual peculiarities for human natures. And who would venture any decision in this respect at the present state of research!⁴¹

40 Kurt Goldstein: Notes on the development of my concepts, p. 5.

41 Kurt Goldstein: Ueber Rassenhygiene, Leipzig 1913, p. 34.

This solidly indicates that even the great holistic neurologist had paid tribute to the demands of the contemporary social discourses on “weeding out the unfit” and “mobilizing” the bodies of the German people – in the wake of the Great War. For the purposes of our argument, we henceforth focus on Goldstein’s work as a promising researcher during the war period and until 1930, where he was deeply preoccupied with the devastating influences of the war, having diagnosed and treated the brain-injured veterans, yet having kept close contact with the psychoanalytical chair of the newly created University. In addition to his interest in the neuroanatomical perspective, Goldstein’s approach to war-related brain injuries also involved a rather intuitive and empathic act of understanding:

In accordance with the spirit of the times in medicine, I was attracted to the idea that sickness should not be considered something which befalls the individual from the outside, but that one should rather treat the sick personality, a concept which had gained wide consideration in Germany already at the beginning of the century.⁴²

Most outstanding are Goldstein’s experiments on “the physical constitution of the brain” in his collaborative work with Adh  mar Gelb, Walter Riese (1890-1976), and other Frankfurt co-workers. In fact, the social and cultural impact of the First World War gave a compelling urgency to the work and efforts of many holistic physicians and psychologists and Goldstein affectionately recalled Edinger saying: “Your work with human beings is of much greater importance than my theoretical work in the laboratory.” The Institute for Research into the Consequences of Brain Injuries, where Goldstein now worked, had been a part of the medical preparations – in 1916 – for the fierce Battle of Verdun at the Western Front and remained in operation throughout the Weimar Republic and until the Nazis seized power in 1933.

42 Kurt Goldstein: Notes on the development of my concepts. In: Goldstein, Selected Papers, p. 10.

it was claimed that 73 per cent of the patients had been able to return to their old professions, 17 per cent started a new job, 10 per cent remained unemployed and another 10 per cent hospitalized.⁴⁵

Goldstein's work and research program, however, would have been impossible without the help of his collaborator Gelb who designed the psychological tests for the returning war-injured and later helped to develop the research program on speech disorders, motor deficits and eventually developed new rehabilitative approaches. With regard to the debate about the physical constitution of the brain, Goldstein's experiments with Gelb and Riese regarding behaviour improvement in young soldiers slowly raised doubts about the biological reintegration and regeneration in the human nervous system. Most notably they reflected on the 24-year old patient Schneider, who had two lesions in the posterior part of his brain (i.e. the visual cortex) and similar to many of their other patients, Goldstein and Gelb realized that other parts of the human brain must have taken over functions from the destroyed parts of his brain. This meant that the brain had adaptive capacities even in adult patients and through theoretical and practical learning; it should be possible to at least partly compensate for the losses owing to war injuries. They noted that Schneider was still able to read any text through "a series of minute head and hand movements – he 'wrote' with his hands what his eyes saw [...]. If prevented from moving his head or body, the patient could read nothing whatsoever."⁴⁶ This meant that body movements partly compensated for cognitive loss of function and the physical constitution of the brain certainly played some part in the recovery of functional impairment. Following their work, however, this could not have been the full story: When investigating language recovery and change, cognitive disorders and their interrelation with practical skills, or the reconditioning of balance and stability in patients with quivering limbs – through application of the newest principles of psychotechnics –,⁴⁷ Goldstein and his collaborators began to realize that the effects of the "catastrophic reaction" could rule out anatomical destruction. But, it was Goldstein's conviction that more still had to be

45 Harrington, *Die Suche nach Ganzheit*, p. 282.

46 Goldstein, Kurt et al.: *Psychologische Analysen hirnpathologischer Fälle auf Grund von Untersuchungen Hirnverletzter. I. Abhandlung. Zur Psychologie des optischen Wahrnehmungs- und Erkennungsvorgangs.* In: *Zeitschrift für die gesamte Neurologie und Psychiatrie* 41 (1918), I.1, pp. 1-142, esp. 124.

47 Cornelius Borck: *Hirnströme. Eine Kulturgeschichte der Elektroenzephalographie*, Göttingen 2005, pp. 99-101.

learned about the regeneration, adaptability and the structure-function relationship as was widely believed in the neurology of his time.

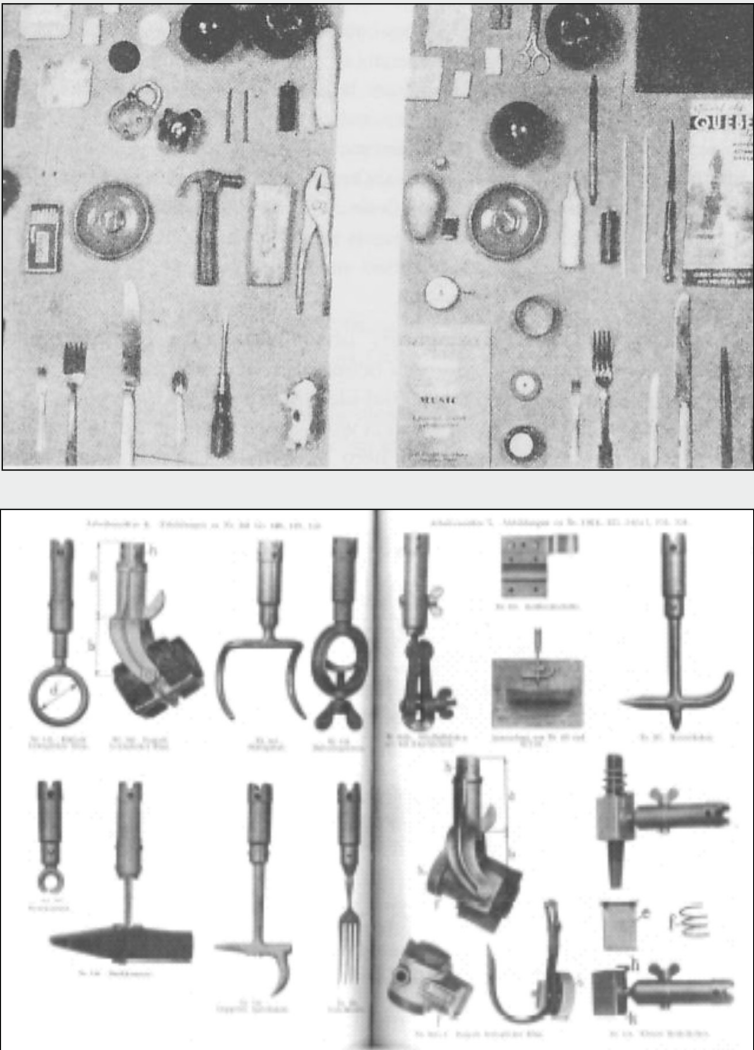


Fig. 4: Gelb’s “test box” for psychological and movement anomalies directly reflects the mechanical tool set of the “Siemens’ standard prosthetic arm”

Goldstein and his colleagues found that similar symptoms can essentially be of different origins, often leading to an inadequate treatment.⁴⁸ The same patient who was unable to achieve the task: “Close your eyes!”, was able to execute this order when he was asked again to show how he was falling asleep. A patient with a lesion of the cerebellum, who was unable to point with his finger to the tip of his nose, was actually capable of grasping his nose (see Fig. 5).⁴⁹ Goldstein discovered that there were at least two different groups of symptoms: The first group includes symptoms of behaviour in everyday situations like simply turning on a light switch or saying “Hello!” at a reception. These forms of behaviour are more or less unconscious, unreflective and belonging to the situation. The second group includes symptoms with regard to abstract behaviour in the sense of awareness, reasoning and self-account of one’s doing.⁵⁰ While the first group of symptoms were related to delimited lesions of one field, the second group appeared somewhat to be the result of the isolation of one field and the change of the interaction with other fields. The task in our example: “Close your eyes!” is a totally abstract request. The patient was unable to fulfill it because he had to abstain from the concrete situational demands. Goldstein made the remarkable discovery that those patients, who seemed severely handicapped, could be re-integrated partially into normal life if their concrete attitude was taken into account. The distinction between abstract and concrete behaviour also explained a number of phenomena, particularly the different types of aphasia, which are now found to have a more or less consistent explanation.

48 Kurt Goldstein: Notes on the development of my concepts. In: Goldstein, Selected Papers, p. 3.

49 Kurt Goldstein: Über Zeigen und Greifen. In: *Der Nervenarzt* 4 (1931), I. 1, p. 454.

50 Kurt Goldstein et al. : Abstract and Concrete Behavior. In: *Psychological Monographs* 239 (1941), I. 2, pp. 2-4.



Abb. 1. Vorbeizeigen.

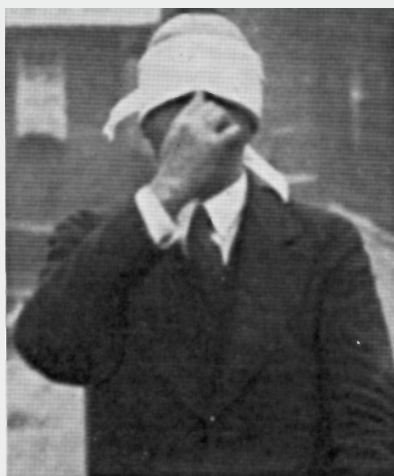


Abb. 2. Richtiggreifen.

Fig. 5: “Abstract and concrete behaviour”:

1. Failed pointing movement; 2. Successful grasping movement.

There is certainly something unique to the Weimar cultural context, in which the Goldstein Group worked and where such a variety of different values was brought together in a highly original and innovative way: shock – Angst – paralysis – speech varieties – art – craft practices – memories – or hope, as phenomena of study were related to and reflected in the interactions with the Swiss psychiatrist Otto Binswanger (1852-1929), the Austrian psychoanalyst Sigmund Freud, Adhémar Gelb, Victor Klemperer, and Albrecht Bethe.



Fig. 6: “Catastrophic Reaction”: A war-injured soldier, who had lost both of his arms due to a shell explosion, paints a vase with his mouth – a phenomenon which Goldstein and Bethe contributed to the vicarious functioning of multiple brain centers.

In the case of this interdisciplinary research group – including the contributing laboratory assistants, nurses, wardens and comrades – Goldstein’s humanistic and clinical aspirations followed, to a great extent, the general dialectic between Weimar – as emerging from the catastrophe – and the unimaginable laboratory of medicine – that the Great War had ultimately been –. All those overreaching themes eventually led to the creation of the amalgamated neurological research program in the pristine home of reason, peace, and individual freedom in the confinements of “Villa Sommerfeld”.

In retrospect, however, it is very evident that the story that the Goldstein group tells us is more about the actual makings of medicine and neuroscience, when it is followed into its various philosophical and psychological approaches, the technologies available, or its communication with the Psychoanalytic Institute in Frankfurt or the Gestalt psychologists in Berlin. In following these pathways, we find many neuroscientists, such as Karl Stern, Albrecht Bethe, Walter Riese or Frieda (Fromm-)Reichmann (1889-1957), and psychologists, mainly

Adhémar Gelb and Karl Landauer, to be sternly influenced by issues of holism. With a direct view to the post-war medical situation and the socio-political dimensions of the Weimar Republic, the aura around holistic concepts in medicine and psychiatry decreased while having to give room to contemporary discourse about neurodegeneration, which now shifted away from traditional perceptions of clinical problems in the rehabilitation of casualties and from the investigation of the underlying nutritional processes. Yet with their holist emphasis on rehabilitation, the pupils and collaborators of the German-Jewish neurologist Kurt Goldstein pursued a line of medical research and clinical treatment that according to John Cornwell,

was generally criticized by Nazi doctors for its 'negative features', which were described as 'liberalism, individualism, mechanistic-materialist thinking, Jewish-communist human ideology, lack of respect for the blood and soil, neglect of race and heredity, emphasis on individual organs and the undervaluing of soul and constitution'.⁵¹

Persecution, flight, and emigration to other countries such as Holland, France, England, and North America were basic reasons for the Goldstein Group to develop later into an altogether loosely formed network after 1933. It not only lost its strong interdisciplinary ties, which it had earlier on with Frankfurt and Berlin, but with the dissemination of its collaborators to New York, Montreal, Maryland, Kansas and Richmond, etc. it no longer had the earlier cohesion and momentum. Also, the members of the group encountered a very different research landscape and atmosphere that was motivated by different scientific goals – often not having an understanding for the integration of neurology with philosophy, psychology and rehabilitation that the research program of the group of holist neurologists had in the past. Goldstein himself was quite aware of these difficulties when he spoke about the overly pragmatic and applied context of American psychology and psychiatry:⁵²

He [Kurt Goldstein] was grateful to the country where he and so many others had found asylum first, and a new home – but it was still a home in exile. When he appreciated things American, or criticized them, it was always as an outsider, a spectator. [...] It was

51 John Cornwell: *Hitler's Scientists. Science, War, and the Devil's Pact*, New York 2003, p. 154.

52 Goldstein, *Notes on the development of my concepts*, p. 11 f.

the American experience that he lacked. In part, I think, it was also a difference of generations. Most of the 'Americans' of his acquaintance were a generation or two younger, and the difference in experience was historical as much as geographical. For example, he would often comment on the lack of tradition on this side of the Atlantic. I [Marianne L. Simmel] remember once replying that all the tradition in the world would not help anyone to even the tiniest hamburger, be it here or in Europe. His immediate reply was 'Ach was,' followed by 'The younger generation thinks only of its stomach,' and, finally by 'You are probably right, and that is just what is so awful.' I never could argue him out of that final adjective.⁵³

Although Goldstein – now 60 years of age – tried whatever he could to re-establish productive intellectual communication with his brother-in-law Ernst Cassirer in New York (dying five years later), his new Post-Doc, the experimental psychologist Martin Scheerer (1900-1961), the Cambridge education scholar Robert Ulrich (b. 1905) and the phenomenologist Aron Gurwitsch (1901-1973), this work only gained some ground in physical therapy and rehabilitative psychology.⁵⁴ Being forced to practice for his living and the survival of his family, Goldstein toured and lectured at diverse places, while stretching his research interests increasingly into psychology and sociology. This is further reflected in the description of the Harvard psychologist Marianne Simmel, who had met Goldstein in 1942 and judged that forced migration had ruined Goldstein's career as a clinical neurologist.⁵⁵ As she states, he did not find the right scientific culture he was looking for, so that he never seemed to feel right or at home. Or as his friend cunningly summarized while reflecting on Goldstein's Harvard lectures:

[Americans] wondered suspiciously about his many-sided interests, which extended from medical research to psychology and philosophy.

53 Simmel, Kurt Goldstein, p. 9f.

54 Belz, Kurt Goldstein (1878-1965) – Lebens- und zeitgeschichtliche Hintergründe, or: Harrington, Die Suche nach Ganzheit, pp. 259-317.

55 Simmel, Kurt Goldstein, p. 9f.

*What was he really they asked: a physician, a psychologist or a philosopher?*⁵⁶

4. Conclusion

At the end of this article, we have moved full circle: Beginning with Goldstein's socialization into the multicultural and open city of Breslau in the last decennia of the German Empire, we have followed Goldstein into his studies of philosophy, medicine and psychiatry, which predisposed him to taking an interdisciplinary approach to brain and nervous injuries as well as the rehabilitation of psychic and motor functions within the setting of the new specialized centers for brain injuries. After WWI and through the interactions of so many individuals from the contemporary neurosciences and related fields, such as clinical neurology, experimental psychology, psychoanalysis, and neurophysiology, Goldstein's group engaged in an early rehabilitation program that sought to fully reintegrate the patients into society at large. We have also seen that this approach to restoring psychological and motor functions did not only rely on the culture of a particular period at the end of WWI and the beginning of the Weimar Republic, but it was also a reflection of the multiperspective approach of many of Goldstein's co-workers. This specific approach to physiological experimentation, clinical psychology and early rehabilitation could only flourish in its particular cultural milieu, while the forced-migration of most of the members of the group destroyed this potential. The outcome in no way resembled its foundation, and the American reception of the work occurred almost alone in specialized rehabilitation communities (with Gordon Allport, 1897-1967, Gardner Murphy, 1895-1979, Abraham Maslow, 1908-1970, or Carl Rogers, 1902-1987) as well as Goldstein's new friends). Despite these marginal outcomes, the clinical neurologist – whom Goldstein had primarily understood to be himself – barely left an imprint in his new host country:

The incredibly rapid development of our field in the 50's and 60's of this century was bound to make Goldstein into an historical figure, seemingly before his time, but history has a curious way of reaching

56 Robert Ulrich: Kurt Goldstein. In: Simmel, Kurt Goldstein, p. 15.

*into the present and of replaying half-forgotten themes in the future.*⁵⁷

In this way, the neurological study of movement and functional reintegration during the Interwar Years also indicates an analysis of moving scholars, research programs and institutions. As grand as Goldstein's legacy to modern neurorehabilitation might be, it nevertheless shows how politically and culturally vulnerable the organization of neuroscientific research often is.

57 Teuber, Kurt Goldstein's role, p. 299.

Bibliography

Ash, Mitchell G.: Gestalt psychology in German culture, 1890-1967. Holism and the quest for objectivity, Cambridge 1995.

Belz, Wolfram: Kurt Goldstein (1878-1965) – Lebens- und zeitgeschichtliche Hintergründe. In: Gerhard Danzer (ed.): Vom Abstrakten zum Konkreten. Leben und Werk Kurt Goldsteins (1878-1965), Frankfurt/M. 2006, pp. 11-70.

Ben-Yishay, Yehuda and Diller, Leonard Diller: Kurt Goldstein's Holistic Ideas – An Alternative, or Complementary, Approach to the Management of Traumatically Brain-injured Individuals. In: US Neurology 4 (2008), I. 1, pp. 79-80.

Benzenhöfer, Udo and Kreft, Gerd: Bemerkungen zur Frankfurter Zeit (1917-1933) des jüdischen Neurologen und Psychiaters Walther Riese. In: Schriftenreihe der Deutschen Gesellschaft für Geschichte der Nervenheilkunde 3 (1997), I. 1, pp. 31-40.

Borck, Cornelius: Hirnströme. Eine Kulturgeschichte der Elektroenzephalographie, Göttingen 2005.

Brock, D. Heward and Harward, Ann (eds.): The Culture of Biomedicine, Newark, London 1984.

Cornwell, John: Hitler's Scientists. Science, War, and the Devil's Pact, New York 2003.

Crouthamel, Jason: Invisible traumas: Psychological wounds, World War I and German society, 1914-1945. PhD Thesis Bloomington, IN 2001.

Debru, Claude: Georges Canguilhem: Science et non-science, Paris 2004.

Galison, Peter, Graubard, Stephen R., and Mendelsohn, Everett (eds.): Science in Culture, New Brunswick, NJ, London, 2001.

Goldstein, Kurt: Über Rassenhygiene, Leipzig 1913.

Goldstein, Kurt: Das Symptom, seine Entstehung und Bedeutung für unsere Auffassung vom Bau und von der Funktion des Nervensystems. In: Archiv für Psychiatrie 76 (1925a), I. 1, pp. 84-108.

Goldstein, Kurt: Zur Theorie der Funktion des Nervensystems. In: European Archives of Psychiatry and Neurosciences 74 (1925b), I. 1, pp. 370-405.

Goldstein, Kurt: Über das Problem der Angst (1927). In: Kurt Goldstein: Selected Papers / Ausgewählte Schriften (Reprint), The Hague 1971, pp. 231-255.

Goldstein, Kurt: Die Neuroregulation. Referat. In: Verhandlungen der Deutschen Gesellschaft für Innere Medizin 43 (1931a), I. 1, pp. 9-13.

Goldstein, Kurt: Das psychophysische Problem in seiner Bedeutung für ärztliches Handeln. In: Therapie der Gegenwart 72 (1931b), I. 1, pp. 1-11.

Goldstein, Kurt: Über Zeigen und Greifen. In: Der Nervenarzt 4 (1931c), I. 1, pp. 453-466.

Goldstein, Kurt: Der Aufbau des Organismus: Einführung in die Biologie unter besonderer Berücksichtigung der Erfahrungen an kranken Menschen, The Hague 1934.

Goldstein, Kurt: Human Nature in the Light of Psychopathology, Cambridge, MA 1940.

Goldstein, Kurt: Autobiography, ed. by Walter Riese. In: Riese, Walter, Boring, Edwin G., and Lindzey, Gardner (ed.): A history of psychology in autobiography, New York 1967, vol. 5, pp. 145-166.

Goldstein, Kurt: Notes on the Development of my Concepts. In: Gurwitsch, Aron, Goldstein Haudek, Else M., and Haudek, William E. (eds.): Kurt Goldstein. Selected Papers, The Hague, 1971, pp. 1-15.

Goldstein, Kurt, and Gelb, Adhémar: Psychologische Analysen hirnpathologischer Fälle auf Grund von Untersuchungen Hirnverletzter. I. Abhandlung. Zur Psychologie des optischen Wahrnehmungs- und Erkennungsvorgangs. In: Zeitschrift für die gesamte Neurologie und Psychiatrie 41 (1918), I. 1, pp. 1-142.

Goldstein, Kurt, and Scheerer, Martin: Abstract and concrete behavior: An experimental study with special tests. In: Psychological Monographs 239 (1941), I. 2, pp. 2-4.

Harrington, Anne: Die Suche nach Ganzheit. Die Geschichte biologisch-psychologischer Ganzheitslehren: Vom Kaiserreich bis zur New-Age-Bewegung [Engl. 1999], Reinbek bei Hamburg 2002.

Hartmann, Karl Ernst: Lehrbuch der Kriegsbeschädigten- und Kriegerhinterbliebenen-Fürsorge mit bes. Berücks. d. neuen sozialpolit. Maßnahmen d. Reichsregierung, Berlin 1919.

Harwood, Jonathan: Styles of Scientific Thought. The German Genetics Community 1900-1933, Chicago 1993.

Hofer, Hans-Georg Hofer: War neurosis and Viennese psychiatry in World War One. In: Macleod, Jenny, and Puseigle, Pierre (eds.): Uncovered fields. Perspectives in First World War studies, Amsterdam 2004, pp. 243-260.

Hoffmann, Thomas: Psychische Räume abbilden – Kurt Lewins topologische Psychologie und ihr Beitrag zu einer dynamischen Theorie geistiger Behinderung. In: Stahnisch, Frank and Bauer, Heijko (eds.): Bild und Gestalt: Wie formen Medienpraktiken das Wissen in Medizin und Humanwissenschaft? Münster u. a. 2007, pp. 75-98.

Kreft, Gerald: Deutsch-jüdische Geschichte und Hirnforschung. Ludwig Edingers Neurologisches Institut in Frankfurt am Main, Frankfurt/M. 2005.

Luria, Alexander R.: Kurt Goldstein and Neuropsychology. In: Neuropsychologia 4 (1966), I. 1, pp. 311-313.

Levine, Donald: Georg Simmel on Individuality and Social Forms, Chicago 1971.

Neumärker, Klaus-Jürgen Neumärker, and Bartsch, Andreas-Joachim: Karl Kleist (1879–1960) – A Pioneer of Neuropsychiatry. In: History of Psychiatry 14 (2003), I. 4, pp. 411-458.

Noppeney, Uta: Abstrakte Haltung – Kurt Goldstein im Spannungsfeld von Neurologie, Psychologie und Philosophie, Würzburg 2000, pp. 144-153.

Noppeney, Uta: Kurt Goldstein – A Philosophical Scientist. In: Journal of the History of the Neurosciences 10 (2001), I. 2, pp. 67-78.

Plänters, Thomas, Laier, Michael, and Otto, Hans-Heinrich (eds.): Psychoanalyse in Frankfurt am Main. Zerstörte Anfänge. Wiederannährung. Entwicklungen, Tübingen 1996.

Radkau, Joachim: Das Zeitalter der Nervosität. Deutschland zwischen Bismarck und Hitler, Munich 1998.

- Rothe, Hans-Joachim:** Ein exemplarisches Schicksal: Karl Landauer (1887–1945). In: **Plänters, Thomas, Laier, Michael, and Otto, Hans Heinrich (eds.):** Psychoanalyse in Frankfurt am Main. Tübingen 1996, pp. 87-108.
- Schmidgen, Henning, Geimer, Peter, and Dierig, Sven (eds.):** Kultur im Experiment, Berlin 2004.
- Simmel, Marianne L.:** Kurt Goldstein 1878-1965. In: Marianne L. Simmel (ed.): The reach of mind. Essays in the memory of Kurt Goldstein, New York 1968, pp. 1-10.
- Shevell, Michael I.:** Neurosciences in the Third Reich: from Ivory Tower to Death Camps. In: The Canadian Journal of Neurological Sciences 26 (1999), I. 2, pp. 132-138.
- Stahnisch, Frank:** Making the Brain Plastic: Early Neuroanatomical Staining Techniques and the Pursuit of Structural Plasticity, 1910-1970. In: Journal of the History of the Neurosciences 12 (2003), I. 4, pp. 413-435.
- Stahnisch, Frank:** Ludwig Edinger (1855-1918) – Pioneer in Neurology. In: Journal of Neurology 255 (2008a), I. 1, p. 147-148.
- Stahnisch, Frank:** Psychiatrie und Hirnforschung: Zu den interstitiellen Übergängen des städtischen Wissenschaftsraums im Labor der Berliner Metropole – Oskar und Cécile Vogt, Korbinian Brodmann, Kurt Goldstein. In: Helmchen, Hanfried (ed.): Psychiater und Zeitgeist. Zur Geschichte der Psychiatrie in Berlin, Berlin 2008b, pp. 76-93.
- Stahnisch, Frank:** Zur Zwangsemigration deutschsprachiger Neurowissenschaftler nach Nordamerika: Der historische Fall des Montreal Neurological Institute. In: Schriftenreihe der Deutschen Gesellschaft fuer Geschichte der Nervenheilkunde 14 (2008c), I. 1, pp. 414-442.
- Stahnisch, Frank:** Transforming the Lab: Technological and Societal Concerns in the Pursuit of De- and Regeneration in the German Morphological Neurosciences, 1910–1930. In: Medicine Studies 1 (2009), I. 1, p. 41-54.
- Teuber, Hans L.:** Kurt Goldstein's role in the development of neuropsychology. In: Neuropsychologia 4 (1966), I. 4, pp. 299-310.
- Williams, Elizabeth A.:** The Physical and the Moral. Anthropology, Physiology, and Philosophical Medicine in France, 1750-1850, Cambridge 1994.
- Wittern, Renate:** "Die Politik ist weiter nichts, als Medicin im Grossen" – Rudolf Virchow und seine Bedeutung für die Entwicklung der Sozialmedizin. In: Verhandlungen der Deutschen Gesellschaft für Pathologie 87 (2003), I. 1, pp. 150-157.dd