Karl Kleist (1879–1960) – A Pioneer of Neuropsychiatry
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Karl Kleist (1879–1960) was instrumental in pioneering German neuropsychiatry and neuropsychology, including the description of frontal, constructional, limb-kinetic (innervatory) and psychomotor apraxias, frontal akinesia and aspontaneity, as well as object and form blindness. Besides isolating episodic twilight states, involutional paranoia and symptomatic (especially influenza) psychoses, he was particularly involved in applying Wernicke’s syndromatic and Kraepelin’s prognostic and aetiological principles to classify ‘neurogenous’ psychoses by refuting the assumption of mixed entities whenever possible. Thus, his phasophrenias denoted manic-depressive illness, unipolar affective disorders and marginal, i.e., atypical psychoses. The rather benign cycloid psychoses form the most prominent examples of the latter. Schizophrenias, on the other hand, were limited to poor long-term catamnestic outcomes. Kleist conceptualized the core group of schizophrenic illnesses as psychic system diseases – hence the origin of the term ‘systematic schizophrenias’ within the Wernicke-Kleist-Leonhard School. Kleist was mainly influenced by Wernicke and his psychic reflex arc, but Ernst Mach’s empiriocriticism, Theodor Meynert’s cerebral connectionism, and associationism also shaped his outlook. Kleist’s localization of cerebral functions by lesion analyses was indeed the best available at the time and continues to reveal insights to the interested reader. From his Frankfurt School, which may have been the last of a completely unified neuropsychiatry, came sound representatives of psychiatry, neurology and neurosurgery.
His technical mastery and achievements seem indisputable, but his balancing acts during the Third Reich may today be questioned. Despite joining the National Socialist German Workers’ Party (NSDAP) and the local Court of Genealogical Health (Erbgesundheitsgericht), Kleist was, however, one of the few German physicians who continued to treat Jewish patients, to employ Jewish colleagues and to voice evident criticism of the policies of ‘eugenics’ and ‘euthanasia’.

This paper attempts to illuminate Kleist’s biography and life’s work in the relevant historical context.

Keywords: biography; brain research; history; Karl Kleist; neuropsychiatry

1 Introduction

One issue that has often been addressed is whether historical development follows regular patterns. This has also been discussed as far as the history of neurology and psychiatry, or neuropsychiatry, is concerned. In his overview, Martin (2002) gave his opinion as regards the integration of neurology, psychiatry and neuroscience in the twenty-first century. As Yudofsky and Hales (1989; see also 2002) express it in their description of neuropsychiatry, the ‘indelible inseparability of brain and thought, of mind and body, and of mental and physical’ conditions has somehow guided the development of the interrelated specialities. The life and work of Karl Kleist (1879–1960) is a striking example of this. In an attempt to illustrate the fact that the development of neuropsychiatry has indeed followed certain regularities, we review Kleist’s biography and analyse his work as one of the founders of neuropsychiatry. Of course, Kleist is not singular, but in studying him we sample the history of both Germany and his discipline. In this context of profound tensions, he aspired to become a pioneer of neuropsychiatry.

2 Early development: Kleist as a child, an adolescent and a student of medicine

Karl Kleist was born on 31 January 1879 in Mühlhausen in Alsace, a region which was to have an eventful history. According to the Peace Treaty of Versailles, marking the end of the Franco-German War (1870–71), his hometown – and with it the whole of Alsace and Lorraine – became part of the German Empire; this was proclaimed on the 18 January 1871 in the Hall of Mirrors at Versailles Castle. Moreover, France had to pay five billion francs in reparations (then four billion marks). However, the integration of Alsace-Lorraine into the German Empire proved to be fatal. After Germany had lost in World War I, it had to cede even larger territories, including parts of Alsace-Lorraine, to France (Peace of Versailles, 28 June 1919). Six years
later, in the Locarno Treaty of 1925, Germany ultimately gave up this province. But Hitler, who seized power on 30 January 1933, did not feel bound to this agreement, or to several others, as they did not agree with his aims which were to conquer the world, to exterminate the Jews and to destroy all life declared ‘unworthy of living’ and to fight world Bolshevism. This led to World War II, which was fatal for Germany and Europe.

Karl Kleist’s biography mirrors the individual stages in German history. He spent his childhood in Mühlhausen in Alsace, where his father Heinrich Kleist (1833–1917) worked as a railway engineer and director of a repair shop. His mother Emilie (1845–1944) was the daughter of an ecclesiastical commissioner and priest in Trier. Karl attended the local grammar school, where he was a fellow-pupil of Albert Schweitzer (1875–1965). In 1897 he took his Reifeprüfung, and as the best graduate he had to deliver that year’s vote of thanks – and did so in Greek. From 1897 to 1902 he studied medicine in Strassburg, Heidelberg, Berlin and Munich.

It is worthwhile at this point to have a closer look at the state of psychiatry and neurology, and also at the people with whom Kleist had contact at the universities where he studied. In Strassburg in 1872, just two years after Alsace had been annexed by the German Empire, a chair of psychiatry was established at the newly-founded university, and 32-year-old Richard von Krafft-Ebing (1840–1902) appointed as the first professor. Pichot (1983) highlighted the remarkable fact that of the 29 psychiatric professorships in Germany 21 were established before 1880, and 14 of those (i.e., half the total) between 1860 and 1880. Almost all these chairs were for neuropsychiatry or mental and nervous diseases. Thus, the second half of the nineteenth century marked the start of the heyday of neuropsychiatry in Germany and the German-speaking countries. One need only recall the description of hebephrenia by Ewald Hecker (1843–1909) in 1871 and of catatonia by Karl Ludwig Kahlbaum (1828–99) in 1874. Only one year later, Friedrich Jolly (1844–1904), aged only 29 years, became Krafft-Ebing’s successor as professor in Strassburg. In 1890, when Jolly accepted his appointment as professor at the Charité in Berlin, he was succeeded by Karl Fürstner (1848–1906), a student of Carl Westphal (1833–90), who was to remain in Strassburg from 1 April 1891 until his death. Before his appointment, Fürstner had been director of the department of psychiatry in Heidelberg. With him came assistant Alfred Erich Hoche (1865–1943), who had written his MD thesis on a neurological subject under Wilhelm Erb (1840–1921) and submitted his thesis to become a university lecturer together with Fürstner. On 27 June 1902, however, Hoche was appointed as Professor of Psychiatry at the University in Freiburg im Breisgau where he worked until 1933.

In Heidelberg, where Kleist continued his training, he studied under Emil Kraepelin (1856–1926). Kraepelin worked there from 1891 until 1903, the year he was appointed as professor at Munich University. For a short time
after that Karl Bonhoeffer (1868–1948) took over as acting head. In 1904 Franz Nissl (1860–1919) was appointed. When he retired in 1918 he was succeeded by Karl Wilmanns (1873–1945) who is regarded as the major figure of the so-called ‘Heidelberg School’, which had its peak between 1909 and 1932. Its most well-known representatives were Karl Jaspers (1883–1969), Hans Walter Gruhle (1880–1958), Wilhelm Mayer-Gross (1889–1961), Kurt Beringer (1893–1949) and child and adolescent psychiatrist August Homburger (1873–1931). The major aim of the Heidelberg School was to describe disturbed mental states as exactly as possible. The textbook on ‘General Psychopathology’ (Jaspers, 1913) is regarded a standard work exemplifying this new approach to the clinical diagnostics and classification of mental illnesses. Homburger’s 852-page ‘Lectures on the Psychopathology in Children’ of 1926 has the same significance as far as child and adolescent psychiatry is concerned. Homburger had worked on this book for eight years. In it he integrated the results of his investigations in developmental and gestalt psychology as well as studies of character. For the first time ever, the book underlined the importance of the developmental factor, hinting at the fact that pathological phenomena in children were not as static as in adult psychiatry, but differed much more depending on age and other factors. In his work, Homburger had adopted ideas from Freud’s psychoanalysis and Kretschmer’s constitutional typology.

The ‘spiritus heidelbergensis’, i.e., the phenomenological descriptive approach to modern psychopathology, was to have a major impact on German psychopathological research and psychiatry. Wilhelm Erb exerted a profound influence on this through his neurological research and even laid the foundation for a separate neurological school in Heidelberg. The interrelations of psychiatry and neurology in Heidelberg in the 1920s and 1930s have been thoroughly described by Pantel (2001).

Being a student in Berlin, Kleist witnessed the reconstruction and renovation of the Charité, its hospitals, clinics and institutes, which altogether lasted for nearly a decade. These efforts, however, were to pay off: from the turn of the century the Charité clinics were undisputedly regarded as the top among Prussia’s scientific and medical institutions. This successful development was also due to the work of Friedrich Althoff (1839–1908), Commissioner and Under-Secretary in the Ministry of ‘Spiritual, Teaching and Medical Affairs’ (Ministerium der Geistlichen, Unterrichts- und Medizinalangelegenheiten), who also played an active part in the appointment of professors. Moreover, he is said to have actively promoted the establishment of departments of psychiatry and neurology at universities, not least for pecuniary reasons.

Kleist completed his studies in Munich in 1903 by defending his MD thesis (Kleist, 1903b) under Anton Bumm (1849–1903) and finally received his licence as a doctor. In the same year his supervisor died. Bumm, who had previously worked at the asylum in Erlangen, had been appointed as Fellow Professor of Psychiatry at Munich University in 1896. Under his guidance
Kleist published his first scientific paper ‘Changes in the spinal ganglion cells after cutting the peripheral nerve and the dorsal root’ in the influential journal *Virchows Archiv* in 1903 (Kleist, 1903a; Fig. 1), which was based on his MD thesis. One year later, when Kleist was 24, an enlarged version of this paper was published in the same journal (Kleist, 1904) which stated that he had been awarded a prize by the Royal Ludwig-Maximilian-University in Munich. However, Kleist signed the paper as ‘assistant surgeon at the Royal Hospital of Psychiatry and Neurology at Halle University’, his next place of work.

3 Entering the world of neuropsychiatric hospitals: Kleist and his environment

At the Halle hospital, which was opened as the first of its kind in Prussia, Kleist did his specialist training from 1903 to 1908. Here too he came in contact with several leading representatives of his profession; in chronological order, they were Theodor Ziehen (1862–1950), Carl Wernicke (1848–1905) and Gabriel Anton (1858–1933). Wernicke was to have a particularly lasting influence on Kleist, although they knew each other for only a year: from 1 April 1904 until Wernicke’s tragic death on 15 June 1905. The ideas of Wernicke served as a guideline for Kleist and thus laid the basis for the later so-called Wernicke-Kleist-Leonhard School (Beckmann et al., 2000; Ungvari 1993).

Ziehen worked at Halle for just half a year, and probably regarded his time here as some kind of interlude. At the time, however, this was not unusual. Ziehen had begun his academic career in 1900, when he was appointed as Professor of Psychiatry at the University of Utrecht in the Netherlands. Then he went on to Halle and shortly after that to Berlin’s Charité where he succeeded Jolly. After giving up his post at the Charité in 1912, Ziehen was to return to Halle again in 1917, for a longer period and as Professor of Philosophy. He was one of the major representatives of Ernst Mach’s (1838–1916) empiriocriticism in Germany.

For Kleist, Ziehen was also a remarkable personality, not least because he
had worked under Karl Kahlbaum in Görlitz from 1885 to 1886 and as senior assistant under Otto Binswanger (1852–1929) in Jena for 14 years. Furthermore, as Seidel (1988) pointed out in his analysis of Ziehen’s work, the latter revealed many similarities with Wernicke’s concept, especially in the fields of anxiety and confusional psychoses, as well as cyclic psychoses. Later, when he proposed his concept of affective disorders (psychoses) in contrast to that of manic-depressive illness as framed by Kraepelin, Kleist proved that he had continued Ziehen’s approach.

Wernicke had started his career in Breslau, where he became professor in 1885. After quarrels, however, he left Silesia and in 1904 was appointed as Ziehen’s successor at Halle University. By this time he had already established the main body of his psychiatric and neurological work which was largely based upon his notion of the so-called psychic reflex arc, Gustav Theodor Fechner’s (1801–87) psychophysics, Theodor Meynert’s (1833–92) cerebral connectionism, and associationism. Wernicke’s major projects in Halle were concerned with further developing his concept of psychoses, mainly that of anxiety and motility psychoses (which were incidentally first described by him) as well as the concept of expansive autopsychosis and hallucinosis. As a result of his work, terms such as retentivity in memory [Merkfähigkeit], predominant or autochthonous idea became broadly accepted. He also described polioencephalitis haemorrhagica superior (later renamed Wernicke’s, or alcoholic, encephalopathia), cerebral hemiplegia (later called Wernicke’s and Mann’s predilection type), paralysis of the sense of touch, and hemiopic pupil reaction (later called Wernicke sign). In his psychopathological works, Wernicke not only described the phenomena and complexes of symptoms in great detail by his syndromatic principle, but he also made efforts to locate the underlying processes in the brain and to clarify the presumed ‘sejunction’, i.e., the disconnections causing the conditions, aetiologically. Thus, pathological processes in the brain were to make up the centre and focus of his research activities. He had demonstrated this principle successfully as early as 1874 when, at the age of 26, he published his work on aphasia subtitled ‘An anatomy-based psychological study’ (Wernicke, 1874; see also Margolin 1991). Wernicke dealt exhaustively with this monumental task. This has been exemplarily shown by Pillmann et al. (2000) who have investigated the in-patient treatments that took place during Wernicke’s professorship. According to the patient directories, there was a total of 1017 in-patients treated during this period, but only 889 patient files have survived. Of these, 564 files were for mentally ill patients. The following diagnoses have been attributed to them: motility psychosis, anxiety psychosis, expansive autopsychosis, acute hallucinosis, and also hebephrenia, mania, confused mania or melancholia. Incidentally, among these files there are several which were obviously written in Kleist’s own hand and carry his diagnostical remarks. Sometimes the latter have been modified by Wernicke.

In 1905 Anton took over his duties at Halle’s Department of Psychiatry as
Wernicke’s successor. In November of the same year he gave his inaugural lecture entitled ‘On restorations of functions of the brain during illness’ (Anton, 1906) in which he set out his scientific approach. Kleist listened to this speech with particular interest. Anton preserved and cherished the brain-anatomical and localizational traditions established by his predecessors, Wernicke and Julius Eduard Hitzig (1876–1903), who had been head of the Halle department between 1876 and 1903, and also his Vienna teacher, Theodor Meynert (1833–92). With the latter, Wernicke had continued his studies on brain anatomy in 1872/73. The solidarity with Anton’s teacher’s ideas is revealed in his works on the structure, the functions and the diseases of the frontal lobe as well as on cortical blindness and deafness. His work was also acknowledged in the eponymous Anton Syndrome or Anton-Babinski Syndrome (hemisomatagnosia and anosognosia). Anton retired in 1926.

Kleist stayed in Halle for five years, from 1903 to 1908. During this period his contact with Wernicke affected him greatly, as shown by the impassioned obituary (Kleist, 1905b) which he dedicated to his teacher and to his monumental work. With his own first works ‘On conduction aphasia’ (Kleist, 1905a) and ‘On apraxia’ (Kleist, 1906b) – both of which were published in the Monatsschrift für Psychiatrie und Neurologie, co-edited by Wernicke and Ziehen – 26-year-old Kleist laid the foundations for his comprehensive pathology of the brain based on the ideas and doctrines of his teacher. He pointed out (Kleist, 1906b: 269), ‘For the understanding of the brain’s diseases and especially the mental illnesses, the concept of apraxia is about to gain an importance similar to that which the concept of aphasia has had for the same fields for the last thirty years.’

Reviewing Liepmann’s (1900) and Pick’s studies on the same topic, Kleist (1906b: 269) summarized:

No one has better acknowledged the present and future importance of doing research in the field of apraxia than did the man whose ingenious questioning the whole speciality actually owes its origin: Wernicke. My presenting this paper was the last assignment my admired teacher gave me.

4 Main issues and tenets of Kleist’s work: apraxia, mental illnesses, psychomotoric brain pathology, and psychoses

In discussing the foundations and main principles of Karl Kleist’s work, we will deal with the topics of his major works in chronological order. However, they cannot be fully understood without taking into account some general and speciality-related historical facts. Four main lines can be followed in Kleist’s œuvre. First, aphasia and apraxia, including his papers:

‘On conduction aphasia’ (1905a)

‘On apraxia’ (1906b)
‘The development and the current state of research on apraxia’ (1912b) the first introductory statement of which (p. 243) underlines Kleist’s own development: ‘Research on aphasia will lead from brain pathology deep into the psychiatric domain.’

Secondly, *speech impediments, mental illnesses and system diseases*, comprising his papers:

‘On aphasia and mental illness’ (1913b, 1914b)
‘On speech impediments of the mentally ill’ (1914a)
‘The concept of schizophrenias as mental system diseases’ (*Heredodegenerations*) (1923)

Thirdly, the line that leads to his thesis submitted to qualify as a university lecturer in Erlangen in 1909 comprising his works:

‘Studies on psychomotoric disturbances in mentally ill patients’ (1908)
‘Further studies on mentally ill patients suffering from psychomotoric disturbances’ (1909)

The fourth field of studies includes Kleist’s comprehensive works in brain pathology. Between 1926 and 1934 he published 10 separate papers: motility disorders, 1926; hearing disturbances (1928); sensory aphasias, 1928; motor aphasias, 1930; the frontal lobe, 1931; disturbances of ego components, 1931; disorders of the brain-stem, 1933; disturbance in the senses of taste and smell, 1933; disturbances of consciousness, 1933; and on the structure and functioning of the cerebral cortex (1934b). These efforts reached a climax in Kleist’s 1408-page book on the pathology of the brain (Kleist, 1934a), on which he had worked for 17 years. In a joint session of the Neurological and Psychiatric Section at the 1936 annual convention of the Gesellschaft Deutscher Neurologen und Psychiater (Association of German Neurologists and Psychiatrists) in Frankfurt/Main Kleist (1936) presented his report on brain pathology and elaborated on its significance for neurology and psychiatry.

Based on these principal ideas, Kleist doggedly and expertly developed a whole interconnected system of theories of neuropsychiatry, which in many respects corresponds well to our present-day concepts of neuroscience. However, at the time Kleist was met with strong criticism and resistance. Maybe that is why he never wrote a textbook on this subject. Possibly he did not even feel it was necessary; at least he never said anything about this.

After his time in Halle, but before going to Erlangen, Kleist worked for
periods of six months at Ludwig Edinger’s (1855–1918) Neuroanatomical Laboratory in Frankfurt/Main and with Alois Alzheimer (1864–1915) at the Department of Psychiatry in Munich. Whereas the Munich laboratory was fully equipped with the most up-to-date technology (Kraepelin was the head of the Munich department) it was not until 1907 that Edinger, at the age of 52, could move from the single room, with which he had to content himself for many years, to the laboratory’s new location in Senckenberg’s Institute of Pathology (today’s Edinger Institute at Frankfurt University); here he was provided with several rooms. Both places gave Kleist the opportunity to study the brain in great detail, viz. the histopathology of mental illnesses under Alzheimer, and comparative brain anatomy, especially of the thalamus, under Edinger, who had incidentally also met and worked with Wernicke and Westphal while in Berlin from 1882 to 1883.

5 The Erlangen years: 1909–16

By 1909 Kleist had received an extensive education in psychiatry and neurology, mastering the most up-to-date diagnostic and therapeutic methods as well as obtaining a detailed knowledge of brain anatomy. At this point he came to work at the Erlangen psychiatric hospital. In the same year he defended his thesis ‘Further studies on mentally ill patients with psychomotoric disturbances’, thus qualifying as a university lecturer under Specht. The subtitle of his manuscript reveals the whole range of disturbances put under dispute and elaborated upon: ‘Hyperkinetic phenomena, disturbances of thought, hypochondriac and affective disorders with akinetic and hyperkinetic patients’ (Kleist, 1909; Fig. 2). Kleist deduced his exact psychopathological diagnoses on the basis of the observations he made and of brain-pathological models, first of all on disturbances in the functioning of the cerebellar-frontal lobe system. He assumed intercorrelations between the disturbances of thought and psychomotoric domains (hyperkinesia vs. akinnesia) on the one hand and the affective disorders on the other, and began to conceive a nosological classification based on these assumptions. The investigations for his thesis had been carried out on 25 patients (16 females, 9 males, among them 6 females and 1 male under the age of 18) with Anton in Halle, and also at the asylums near Halle: Zschadraß, Nietleben and Alt-Scherbitz. By including newly gained knowledge on the functions of the basal ganglia, his models were later further improved and extended (Kleist, 1922). As in his 1906 paper on apraxia, Kleist continued to proceed far beyond Wernicke’s ideas, although his respect for his teacher never diminished. He notably improved and considerably extended: (a) Wernicke’s concept of the so-called ‘psychic reflex arch’, according to which motor disturbance (and others) were based on lesions of the sensomotoric loops, whereas disturbances of actions originated from interruptions of psycho-physical reflex loops; (b) Hugo Karl Liepmann’s (1863–1925) first description of
Fig. 2. Title page of Kleist’s MD submission of 1909

Weitere Untersuchungen an Geisteskranken mit psychomotorischen Störungen

Die hyperkinetischen Erscheinungen.
Die Denkstörungen, hypochondrischen und affektiven Störungen bei akinetischen und hyperkinetischen Kranken

Von

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1. Assistent der psychiatrischen Klinik in Erlangen

Leipzig 1909
Druck von Oscar Brandstetter
(Die Arbeit erschien zugleich im Verlage von Dr. Werner Klinkhardt.)

Fig. 3. Title page of Kleist’s 1408-page monograph on brain pathology (1934a)
apraxia in 1900. Kleist distinguished between motor, ideatoric and constructive forms of apraxia, and regarded their spatial and temporal interconnections as a proof of putative 'intra-psychic sejunction processes', thus expanding the conventional localizationistic and psychopathological approach. In the above-mentioned thesis, Kleist subsequently developed the concept of 'psychomotoric disturbances' inaugurated by Wernicke and acknowledged that 'the concept of psychomotoric hyperkinesia is Wernicke's most personal work, where his talent to observe and analyse things is revealed most remarkably' (Kleist, 1909: 112–13). However, Kleist continued, 'Wernicke did not acknowledge the influence of hyperkinetic motor disturbance on thinking as a conscious process' (p. 234). By describing such processes as the flight of ideas, spurious fussiness, disturbances of memory, incoherence, impulsiveness, rhythmic repetitions of psychomotoric phenomena, and autochtonous ideas, Kleist expanded Wernicke's concepts. These notions of motility and psyche, the will, the motor disturbances and mental processes, above all in the context of schizophrenias, were to attract Kleist for the whole of his life.

While in Erlangen Kleist became an associate professor at the Department of Medicine of Friedrich-Alexander-University in 1915. Moreover, as he himself pointed out in a speech at the first anniversary of the Frankfurt psychiatric hospital in 1931 (Kleist, 1932: 438), when at Erlangen he recognized that 'in Halle I learnt only half of psychiatry' since it was in Erlangen 'and later in Rostock that I got to see the chronic and incurable illnesses, but also with long-term, often relapsing types of non-stultifying psychoses'. As he himself acknowledged, this prevented one-sidedness and let him gain experience both in 'asylum-based and university-based psychiatry' (Kleist, 1932: 441).

These very sincere statements made by the 52-year-old Kleist in Frankfurt show what a major impact the place and the psychiatric institutions where you studied and trained – and the people who trained you – may have on you; and, of course, this is still true. Explaining this further, Kleist stated (1932: 441):

Only after having gained this knowledge there was a chance to successfully restrict the concept of schizophrenia to its real purview and to exclude doubtful cases which had up to then been regarded as belonging to that group and to describe them as separate psychoses – such as involuntary psychosis, motility psychosis, confusion (perplexity), episodic twilight states, and other so-called degeneration psychoses.

While Kleist was in Erlangen, World War I broke out in 1914. Germany, in rapid succession, declared war first on Russia on 1 August 1914, then on France on 3 August and on England one day later. Kleist was to be among those who witnessed and survived two world wars instigated by Germany. Due to general mobilization, 35-year-old Kleist was appointed head of the
neurological department at military hospitals, first at the western front at Douai, then in Lille. Here he learnt how war caused brutality and destruction of human beings – macabre enough through their acute head and brain injuries. However, as doctor and neurologist he tried to cure his patients, at the same time intensively observing and studying the manifold consequences these injuries could have. According to the lesion model, the loss of certain functions indicated their presumed localization in the brain. The results of all these investigations were published in his comprehensive work on brain pathology (Kleist, 1934a; Fig. 3), which therefore also had the subtitle ‘especially due to wartime experiences’. Most certainly, it was by explicit intention that the first sentence read, ‘Brain physiology and pathology are sciences that take quite some time to come to fruition’ (Kleist, 1934a: 343). Summarizing his experience, however, he concluded (p. 344) that ‘the material from the war allows extensive additions in one particular field, but not an extension of our knowledge in general’. As we learn from the epilogue, for this work Kleist had investigated about 300 patients suffering from brain injuries and 106 patients suffering from nontraumatic focal brain lesions from later years at the Frankfurt hospital. In contrast to his war-time patients who suffered from injuries of the cerebral cortex, the latter patients mainly showed damages of the basal region. Thus Kleist was able to get an insight into ‘how strong an impact disturbances in the function of rear parts of the brain could have on cortical syndromes’ (p. 1360).

It was not until these reciprocal subcortico-cortical and cortico-subcortical functional structures were investigated that brain pathology could be extended to a general psychopathology on a brain-pathological basis. The essence of Kleist’s knowledge is represented by his ‘brain maps’ illustrating the ‘localization of the functions of the cerebral cortex on an architectural basis; outside and inside’ (Figs 4a and 4b). These brain-localizational maps were based on Korbinian Brodmann’s (1868–1916) cytoarchitectural theory (1909). Kleist (1934b) extended these maps by further differentiating between spheres and zones (sensory, motor, psychological) as well as mixed zones (sensory-motor, sensory-psychological). There is no doubt that, despite all criticism raised against Kleist’s ascribing of given psychopathological symptoms, groups of symptoms and whole syndromes to certain locations in the brain, the informational content has proven relevant until the present day. Comparing Kleist’s findings with recent results obtained by the most sophisticated and up-to-date technology (e.g., fMRI, PET, SPECT, etc.), one is astonished by the similarities of the final conclusions drawn.

6 Kleist as professor in Rostock, 1916, and his colleagues

In 1916 Kleist was appointed to the chair of psychiatry and neurology at Rostock University and also as the director of the Gehlsheim asylum, which served as the university hospital. Kleist took over from Oswald Bumke
Fig. 4. Localization of functions in the cerebral cortex on an architectural basis (Kleist, 1934a: 1365–6): (a) outside; (b) inside.
(1877–1950) who had started his career by successfully defending his thesis in 1904 with Hoch in Freiburg. Although he had organizational abilities, he did not stay long in Rostock due to difficult conditions. After this he had a meteoric rise: he was appointed to Breslau in 1916, to Leipzig in 1921, and to Munich in 1924 where he succeeded Emil Kraepelin. Bumke was similar to Kleist in primarily belonging to a generation of psychiatrists who were born in the 1880s and had a major impact on the development of the neurosciences during the first three decades of the twentieth century, in Germany and elsewhere. Despite conflicting views on some minor details and positions, they thought that a new era of psychiatry was about to dawn.

The representatives of neurology felt the same and fought for their independence from psychiatry, for several reasons. On the one hand, neurologists and psychiatrists faced quite profound professional and, at times, inter-personal conflicts of interest as well. Nevertheless they were forced to co-operate in the framework of their combined – psychiatric and neurological – departments at the universities. One group, among them Max Nonne (1861–1959), who chaired the Neurological Department at Hamburg University from 1896 to 1933, strove to establish neurology as a discipline of its own and to separate it organizationally from psychiatry. This was opposed by another group – among them Karl Bonhoeffer, head of the Department of Psychiatry and Neurology at the Charité in Berlin from 1912 to 1938 – who insisted that both disciplines, psychiatry and neurology, formed a unified whole and should under no circumstances be separated from each other. Finally, there were also psychiatrists who fought for the development of psychiatry as a separate, autonomous subject; the most prominent member of this group was Emil Kraepelin, Professor of Psychiatry at Munich University from 1903 to 1922.

On the other hand, there were strong differences as to conceptual ideas that challenged the basics of classical psychiatry. One example was the increasingly divergent concept of schizophrenias and its further development. Eugen Bleuler (1857–1939) had inaugurated this term in 1908 and had indicated a totally new approach to this group of illnesses in his 1911 publication ‘Dementia praecox or the Group of Schizophrenias’, in which he somehow challenged the psychopathological concepts of Kraepelin and Wernicke. There were also differences as to the aetiology of psychoses and possible therapeutic concepts. Finally, the phenomenological descriptive approach to modern psychopathology (as introduced by the so-called Heidelberg school, see Section 2, above), constitutional typology (the concept of the so-called Tübingen school) and Sigmund Freud’s (1856–1939) construction of psychoanalysis and psychotherapy were evaluated differently by the individual experts.

One could speak of two groups, or even generations. In one, there were Kraepelin, Freud (both born 1856) and Bleuler (b. 1857), all almost the same age. In the other, there were Kleist (b. 1879) and his contemporaries...
Hans Walter Gruhle (b. 1880, a student of Emil Kraepelin and representative of comprehensive psychology and psychopathology), Ludwig Binswanger (b. 1881, the founder of an anthropological psychiatric school based on Martin Heidegger’s (1899–1976) and Edmund Husserl’s (1859–1938) philosophy), and above all Oswald Bumke (b. 1877), Kleist’s predecessor at Rostock University.

In Austria Constantin von Economo (1876–1931), an excellent brain researcher, whose architectural subdivision of the brain formed another basis for Kleist’s ‘brain maps’, also defended the unity of psychiatry and neurology. The same holds true for the director of the Vienna Department of Psychiatry and Neurology from 1928 to 1945, Otto Pötzl (1877–1962), a noted representative of cerebral pathology who attracted much attention with his 1928 book ‘The Concept of Aphasia from the Point of View of Clinical Psychiatry’, as well as with his description of optical agnosia.

Kleist, who was 37 when appointed, stayed in Rostock for four years, 1916–20. During this time he did much of his work to expand his global neuropsychiatric background. It was during his Rostock period that two of his major studies were published – one on post-operative psychoses (Kleist, 1916), the manuscript of which was finished while Kleist was still serving in the army in January 1916, and another on influenza psychoses (Kleist, 1920). The latter monograph was based on observations made during the encephalitis epidemic of 1917–18 and the influenza epidemic of 1918–19 at the Rostock-Gehlsheim asylum and in war-time patients suffering from so-called ‘Economo’s encephalitis lethargica’. Both books supplemented and added to Bonhoeffer’s 1910 concept of symptomatic psychoses (see Neumärker, 2001). In contrast to Bonhoeffer’s forms of exogenous reactions or acute mental disorders, suggesting a uniformity of mental symptoms despite manifold primary diseases, Kleist stated that: ‘Causes and brain reactions are basically incomparable’ (Kleist, 1916: 28) and that ‘It is therefore inexpedient to call the symptom complexes, which post-operative psychoses belong to, exogenous reactions and to compare them with homonous states as an example of endogenous forms’ (p. 31). Also in the case of influenza psychoses, Kleist (1920: 1) demanded to ‘check Bonhoeffer’s concept of exogenous reactions against my differentiation of heteronymous and homonous complexes of symptoms’. We can see by merely looking at the states of illness that Kleist differentiated – ‘semiconscious states, deliria, hallucinosis, states of incoherence (amentia), hyperkinetic excitement (hyperkinetic-akinetic forms), stupor, depressions’ – that he went far beyond Bonhoeffer. Thus, Kleist proved that ‘in the case of hyperkinetic excitement thinking processes are disturbed in an extraordinarily heavy way’ (p. 1), both as far as the incoherence and the uniformity of formal adhesitivity in thinking are concerned. His psychopathological and brain localizational interest in all forms of psychoses is remarkable. It may well be that from the symptomatic organic psychoses he hoped to gather evidence as to the intercorrelations of
brain structures and their functions and malfunctions that go beyond his own concept of ‘symptomatic instability’. Perhaps he found it possible as early as at this stage to describe and to differentiate the so-called atypic psychoses that belonged neither to the group of schizophrenias nor to that of manic-depressive forms of illnesses. Whatever the case, Kleist had gained enough clinical experience to further develop the theory of psychoses which was, in general, mainly based on Kraepelin’s descriptions. This was clearly revealed in his paper on ‘Autochthonous psychoses of degeneration’ (Kleist, 1921), in which the very first sentence was paradigmatic (p. 1): ‘Since 1911 I have in several papers and lectures tried to back up my hypothesis that the manic-depressive illness is not a homogeneous illness …’. Previously, Kleist had addressed paranoia, involutional paranoia, and motility psychoses (Kleist 1912a, 1913a, 1923). In his paper quoted above, Kleist (1921) also worked out Bumke’s changing opinion as to a narrow interpretation of the manic-depressive illness or the necessity to subclassify it. Furthermore, he challenged Kraepelin, the ‘creator of the manic-depressive illness’, and his view that the latter formed ‘a homogeneous illness’ based upon a common root with interim states but no clear dividing lines between them (Kraepelin, 1904: 1383). Instead Kleist spoke of several forms rather than of a single entity. For the first time, he pointed out its hereditary character as a major argument against a uniform manic-depressive illness as well as against the homogeneity of the autochthonous psychoses of degeneration. Kleist’s statements (1921: 6) prove to be most up-to-date if we compare them to recent molecular genetic findings:

There are primitive phenotypes with a primitive genotype, and there are complex phenotypes, where several primitive genotypes are linked with each other. When transmitted these primitive genotypes follow the rules, whereas the complex ones can be transmitted as a whole, or they can disintegrate when being crossed and bring about primitive genotype elements that follow the rules of transmission.

Based on these facts, Kleist wanted to identify the various illnesses, to investigate their ‘abnormal brain structures’, ‘more subtle faults in the brain’, and ‘disturbances of … the endocrine glands’, as well as to go into the impact puberty, menstruation and menopause may have on the development of these psychoses (Kleist, 1921: 8, 9).

Up to the present, quite a lot of clinical research has been done around these topics under the headings of: neurodevelopmental hypothesis, neurodegenerative hypothesis, neurotoxicity hypothesis, molecular hypothesis, heteromodal association cortex, dysconnectivity syndrome, etc.

The problem of psychoses had been widely discussed since the publication by Wilhelm Griesinger (1817–68) of his 1845 book ‘Pathology and Therapy of Mental Illnesses’, which featured the idea that ‘mental illnesses were illnesses of the brain’. With the increase of theoretical knowledge and
practical clinical experience, however, more and more arguments arose and several opposing views and schools developed. Among those who contributed to this discussion was Gottfried Ewald (1888–1963), who had worked under Kleist’s guidance in Rostock from 1916 to 1918. In his study on ‘Mixed psychosis, psychosis of degeneration, their structure’, published as part of the Festschrift in commemoration of Bonhoeffer’s sixtieth birthday in 1928, he warned against expanding the concept of mixed psychoses any further and advised not to ‘draw differentiation lines where there are none’ (Ewald, 1928). In demanding that ‘an almost countless number of different illnesses’ should not be elaborated, he – among others – also thought of his former teacher Kleist. At the time of writing, Ewald, who had successfully defended his thesis of his postdoctoral lecturing qualification with Specht in 1920, was associate professor in Erlangen. Between 1929 and 1930 a young doctorate candidate happened to be his assistant: Karl Leonhard (1904–88), who then went on to continue his studies in Frankfurt, at the invitation of Kleist who had meanwhile been appointed to the Frankfurt chair and who appreciated Leonhard’s work on the deficit syndromes of the various schizophrenias as observed in another asylum (in Gabersee).

7 Kleist and his position in Frankfurt: 1920–50

On 1 May 1920, at the age of 41, Kleist was appointed as Professor of Psychiatry at Frankfurt University as successor to Emil Franz Sioli (1852–1922). Simultaneously, he became director of the Klinik für Gemüts- und Nervenkranke (Hospital for the Emotionally and Nervously Ill). The roots of this hospital go back to the Heil- und Pflegeanstalt für Irre und Epileptische (Retreat for Madmen and Epileptics) built in 1863. For many years Heinrich Hoffmann (1809–95, also known as the author of Struwwelpeter) had been the director of this institution. Sioli’s work at the Städtische Irrenanstalt Frankfurt/Main (Metropolitan Mental Asylum), as it was called in his time, has been comprehensively acknowledged by Alzheimer (1913). With the appointment of Alzheimer in 1888, Sioli laid the foundations for a strong neuropsychiatric department. Alzheimer stayed at Frankfurt University for 14 years. As Kleist had in 1908, Alzheimer also made contact with Edinger, which was surely another incentive for him to develop a deep interest in neuropathology and neurohistology. In 1889 Sioli further strengthened the neuropathological and anatomical backbone of his institution by appointing Franz Nissl (1860–1919) as his senior assistant. Soon Nissl and Alzheimer became friends and often collaborated in research projects on psychiatric topics and on the cerebral cortex. One result of their co-operation was the 5-volume work ‘Histological and Histopathological Works on the Cerebral Cortex’ (Nissl, 1904–13); the first two volumes were edited by Nissl and the other three were co-edited by Nissl and Alzheimer.

On 8 April 1904 one of Alzheimer’s patients, Auguste D., died at the age
of 51. Alzheimer had followed her disease and also investigated her corpse. In his account (1907) he addressed a ‘strange disease of the cerebral cortex’ as the cause of her infirmity. At Kraepelin’s suggestion his efforts to elaborate the illness and to identify the causes were later acknowledged in the eponymous Alzheimer Disease. Research in this field has continued to be important – and attractive (Graeb et al., 1997; Maurer and Maurer, 1998).

Later, both Alzheimer and Nissl were to work together with Kraepelin, first in Heidelberg and then in Munich, where Kraepelin was appointed as professor in 1903. With Kraepelin, Alzheimer, Nissl, Gaupp and others, Munich was soon to become a stronghold of psychiatry, above all for research on mental illnesses.

When Kleist came to Frankfurt in 1920, he was well aware of the scientific traditions his predecessors had established. However, both Nissl and Alzheimer had already died, both when young: Nissl in 1919, and Alzheimer in 1915; the latter had been professor in Breslau since 1912. Thus, neither the localizational problems nor those of the classification of mental illnesses had been solved by Kraepelin and his co-workers. Nor did this group succeed in establishing the aetiology of the vast majority of mental illnesses, and their localization as well as their exact classification was still poorly understood. Since their cause could, consequently, not be treated by a medical approach alone, psychological, philosophical and psychoanalytical ideas gained an increasingly strong influence on theory and therapy. The approach of Kraepelin and his colleagues towards the human being and society in general, as well as towards the mentally ill patient, were rather different, and influenced both the discipline and society in many ways. Society, its culture and even an entire era were going through a time of upheaval. On the other hand, it was at that time that Oswald Spengler (1880–1936) predicted the decline and fall of Western Civilization in his book of 1918 (Spengler, 1922). And in 1920 Hoche and Karl Binding (1841–1920) published their disastrous book ‘The Release of the Destruction of Life Devoid of Value. Its Measure and Forms’ (Binding and Hoche, 1920).

8 ‘Current trends in psychiatry’: Kleist as clinician and theorist of his discipline

In 1918 Kraepelin gave his review ‘Hundred Years of Psychiatry’ (1918) the subtitle ‘A Contribution to the History of Human Ethos’. Two years later, at the beginning of his book on ‘Manifestations of Insanity’ he came to the conclusion that ‘clinical psychiatric research has in a way reached deadlock’ (Kraepelin, 1920: 1). Nevertheless, for him there was no alternative to clinical observation (i.e., applying the prognostic principle) combined with an aetiological analysis as the basis to clarify the ‘structure of the individual case’. Only this could lead to a reliable ‘differentiation of illnesses’ on the
basis of which ‘comparative psychiatric studies’ could be carried out (p. 2). Summarizing his remarkable work, Kraepelin stated (p. 28):

We must get used to the to the idea that the symptoms on which we base our diagnosis are not sufficiently differentiated to distinguish between manic-depressive illness and schizophrenia reliably in all cases. Instead there may be an overlap based on the origin of the appearance of the illness and its given circumstances.

Bleuler (1914) vehemently defended his views on schizophrenias against those put forward by Gruhle (1913). He also opposed Kleist’s attempts to differentiate paranoid forms, although he too: ‘would have . . . separated them . . . if I had been able to do so.’ (Bleuler, 1914: 20). Here, as well as later in his book, Bleuler acknowledged that ‘there is, however, a fault in my differentiation which has not yet been worked out: it simplifies too much. There are more than merely primary and secondary symptoms. Instead there are long chains of cause and effect.’ (p. 40)

Kleist was well aware of all these trends and closely followed the scientific controversies and developments. For the memorable joint convention of the German Association of Psychiatrists and the Society of German Neurologists in Innsbruck on 25 September 1924, Kleist (1925) and Bumke (1924) were asked to report ‘On current trends . . .’. Bumke, under the heading of ‘clinical psychiatry’, gave an account of many of the contributions of his colleagues from Wernicke to Kraepelin, from Jaspers to Kretschmer, from Schilder to Freud. He sharply attacked some of them with the often-cited statement that the search for the fundamental elements of an illness was as hopeless as ‘trying to clear a cloudy liquid by pouring it into another container again and again’, which goes back to Hoche’s (1912) attempts to grasp the ‘importance of clusters of symptoms in psychiatry’.\(^4\) In contrast, Kleist’s review was markedly systematic, sophisticated and critical. After a thorough investigation of the historical roots of psychiatry, its interconnections to philosophy, its psychophysical and material foundations, Kleist looked critically at the psychological approach and its impact on psychopathology. In this connection, he acknowledged that ‘undoubtedly there will be no progress in clinical research based solely on psychopathology’ (Kleist, 1925b: 20). After looking into psychoanalysis, Kleist comprehensively examined the ‘neurological movement’, especially elaborating the interrelations between ‘pathology of the mantle (pallium) and psychopathology’ and ‘brain stem disturbances and psychopathology’. He also investigated the whole complex of psychomotor disturbances, disturbances of various ego capacities and of consciousness. It should be pointed out that here, as well as in the case of his investigations stimulated by the ‘constitutional movement’, Kleist based his findings on his own research. Throughout his report he demonstrated a profound knowledge of his colleagues’ work, and not only that of his contemporaries. Kleist frequently emphasized that he did not primarily want to criticize or to be at
all ironic about the different approaches, but he wanted to produce a fruitful synthesis instead. He concluded that ‘contemporary psychiatry was mainly influenced by the constitutional approach’. He substantiated this with his own monograph (1926b) on episodic twilight states explicitly intended as a contribution to an ‘Understanding of constitutional Mental Illnesses’. Towards the end of his talk at the Innsbruck convention, Kleist gave a comprehensive account of his concept of (atypical) cycloid psychoses.

9 Kleist’s concept of cycloid psychoses

In this talk, Kleist emphasized that the view that uniformity of the manic-depressive illness could not be maintained any longer. Similarly, this was acknowledged by Kraepelin himself. Bleuler too had put forward self-critical statements in this direction. Kleist pointed out that from his own clinical experience he could not gather any indications which would substantiate the hypothesis of a uniform disease – either in the case of manic-depressive illness, or in that of schizophrenias. Kleist claimed that – quite similar to the epilepsies – there would be a nuclear group, ‘the manic-depressive illness as such’ on the one hand and several ‘atypic forms’, the ‘so-called autochtonous psychoses of degeneration’ on the other. As examples of the latter, Kleist referred to different forms of confusion, motility, anxiety and hypochondriacal psychoses. Their main characteristics, he claimed, was that they showed what he called an ‘affinity with cyclothymia’ and ‘similarities in their course’. Due to their relationship with circular insanity, those illnesses ‘could equally be called cycloid psychoses’ (Kleist, 1925b: 36).

Although Kleist acknowledged the fact that many ‘things were still rather unclear’, he paved the way towards a more detailed differentiation of psychoses which strictly avoided having hybrid or mixed illnesses in it. Kleist had further come to terms with the issue of atypical or marginal psychoses, i.e., those psychotic disorders on the fringe of manic-depressive illness per se. In this landmark, Kleist assumed that functional alterations of the brain-stem apparatus governed affect, formal thinking and psychomotor activities in the phases of these psychoses. However, the concept of cycloid psychoses originated much earlier, mainly in two works of his teacher Wernicke: one on motility psychoses (Wernicke, 1895a), based on a talk given in Breslau in 1892 which was later elaborated in greater detail in his ‘Outline of Psychiatry’ (Wernicke, 1900: 371), and the other on the psychopathology of anxiety psychoses (Wernicke, 1895b) based on a lecture given in Breslau in 1894.

As early as 1912 Kleist comprehensively investigated the position of motility psychoses within clinical classification (Kleist, 1912a). Later he expanded his views on the basis of research done in the field of what he called ‘autochtonous psychoses of degeneration’ and began to speak of cycloid psychoses. Hereby he highlighted the links those illnesses had with
the manic-depressive illness: both were recidivous and essentially bipolar, and both were thought to have a similar ‘constitutional basis’. In his 1924 talk, Kleist cited Kretschmer’s (1921) description of cycloid and cyclothymic dispositions, or personalities. Since Kasanin’s (1933) work on schizoaffective psychoses, these two concepts have been much discussed, and not only as far as prognostically oriented diagnoses of psychoses are concerned. By 1953 Kleist had mostly abandoned the term cycloid psychoses but accommodated bipolar manic-depressive illness, unipolar affective disorders and the marginal (i.e., atypical and particularly former cycloid) psychoses in the notion of phasophrenias (Kleist, 1953). The latter were primarily distinguished according to their poly- or monomorphous symptomatology, i.e., their bi- or unipolarity. Thanks to Kleist’s colleague Leonhard (1957/1979), the concept and term of cycloid psychoses, comprising the forms anxiety-happiness psychosis, excited-inhibited confusional psychosis and hyperkinetic-akinetic motility psychosis, was further developed to make an integrated whole (which, however, contained several transitional stages). Recently, research has also addressed biological foundations of cycloid psychoses (e.g., Jabs et al., 2002).

Present-day nosological systems ICD-10 and DSM-IV partly acknowledge these findings by classifying schizoaffective psychoses as bipolar affective psychoses with psychotic traits. However, another current diagnostic category likely to contain various cycloid psychoses, the stipulated entity of brief psychotic disorders, is not yet further differentiated, either according to its potentially bipolar psychopathological features or according to its risk of recurrence (Beckmann et al., 2000).

10 The problem of catatonias and psychomotor disturbances: the axis from the brain-stem to the cerebrum

Kleist’s first work published as the director of the Frankfurt Department of Psychiatry presented his concept of schizophrenias, which he had developed over the ‘past 12 years’ of his dealing with dementia praecox and with ‘endogenous dementias’ (Kleist, 1919). Thus, Kleist must have begun to elaborate on these illnesses in 1910, soon after having qualified as a lecturer. Like Kraepelin and Bleuler, he acknowledged that schizophrenias formed a ‘group of illnesses’. However, he claimed, ‘through clinical research several forms of this illness could be sub-differentiated on the basis of distinguished elementary symptoms or groups of symptoms’ (Kleist, 1923: 963). Among these forms Kleist highlighted ‘psychomotor dementia (catatonia)’, ‘affective dementia (hebephrenia in the narrower sense)’, and ‘incoherent dementia (schizophrenia in the narrower sense)’ as well as ‘schizophrenia’, ‘paranoid degenerative psychosis’, ‘progressive psychosis of reference and hallucinosis’, and ‘phantasiophrenia’. Because these forms were observed to present as rather stable over long periods of clinical catamneses, Kleist concluded that
they may in fact represent ‘mental system diseases’ where ‘endotoxic substances showed ... an elective affinity towards certain systems of the brain’. Consequently, he compared these diseases to neurological hereditary degenerative disorders as in muscular and cerebellar atrophies or Friedreich’s illness. In various of these cases, there exist mixed forms. In the following years Kleist further substantiated his ideas with results from his own investigations as well as from research done by Cecilie Vogt (1875–1962) and Oskar Vogt (1870–1959) on abnormalities in the brain architecture (striate, pallidum, thalamus) and their correlations with schizophrenias (Herz, 1928; Vogt and Vogt, 1918, 1920). In 1925 Ernst Fünfgeld (1895–1948) had found so-called atrophic cells, i.e., nerve cells that have diminished as a result of fatty degeneration, in the thalamus of patients suffering from catatonic schizophrenias (Fünfgeld, 1925). Although these findings have later been identified as post-mortal artefacts, investigations carried out in the 1950s at Vogt’s Institute of Brain Research in Neustadt/Black Forest and Kleist’s Frankfurt Research Centre for Brain Pathology and Psychopathology were still remarkable. There were, for example, Hopf’s (1954), Fünfgeld’s (1954) and Bäumer’s (1954) comprehensive cytoarchitectural studies on catatonias, paranoid schizophrenias, hebephrenias and ‘non-schizophrenic’ diseases of the pallidum, the striate and the thalamus.

Although Kleist never disregarded cycloid psychoses, his publication record illustrates that until the 1940s and 1950s the clinical courses of catatonias, hebephrenias and paranoid schizophrenias became the main interest of Kleist and his team. He also did much research on the intercorrelations of brain pathology and clinical neuropsychiatry, as shown by his ‘Brain-pathological Reports’ (Nos. 1–10) delivered between 1926 and 1934 (see Kleist, 1934b) and in his major work on ‘Brain Pathology’ (1934a). At the time, brain pathology was largely synonymous with studying neuropsychological and neuropsychiatric sequelae of cerebral lesions. Based upon this lesion model, the localization of cerebral functions was pursued. In this context, Kleist deserves credit for isolating object- and form-blindness, frontal akinesia and aspontaneity as well as frontal, constructional and limb-kinetic (innervatory) apraxias (Bartsch et al., 2000).

Kleist’s untiring dedication to all these topics of interest represented a psychological and physical tour de force, which, however, he took in his stride. Apparently, he did not talk about his feelings, or his stresses or strains. Kleist was not obsessed or fanatic in nature; his way of life (clinical work during the day and writing papers at night), his working morale, his determination, his organizational talent, and last but not least his attitude towards and fruitful co-operation with his patients and employees provided him with all the energy needed to cope with these burdens. This Calvinistic7 trait may be considered typical of the entire Kleist family, although none of its members seems to have adhered strictly to that religious belief.

It seemed logical for Kleist to approach the question of catatonia starting
from his investigations of ‘Psychomotor disturbances and their links with motility disturbances in illnesses of the basal ganglia’ (Kleist, 1922). Here he had comprehensively described their akinetic and hyperkinetic forms as observed in akinesias, mutism and parakinesias, various signs and symptoms indicating so-called reactive and expressive movement disorders as well as different types of negativistic behaviours. The notion of disturbed stirrings and strivings became crucial to Kleist’s concept of psychomotor alterations. In his analyses, he concluded that, undoubtedly, ‘part of these . . . [are to] . . . be located in the basal ganglia themselves’ and cannot exclusively be linked with the frontal lobe (Kleist, 1922: 254–5). Moreover, he claimed that basically the akinetic symptoms of Parkinson’s disease, such as adiadochokinesia or catalepsy, did not differ much from the ‘way mentally ill patients suffering from stupor behaved’. Soon Kleist became most interested in the structure of the striate and the pallidum, and also of the thalamus. He first suggested and then proved neuropathologically through findings in brain sections (Kleist, 1922: figs 1–26) the intercorrelations between ‘extrapyramidal and psychomotor disturbances’ (p. 277). Undoubtedly, these neuroanatomical and pathophysiological findings laid the basis for Kleist’s intensive dealing with catatonias, and some of his investigations lasted for almost 15 years. Kleist and his team also used films to document symptoms of these illnesses such as akinesias, hyperkinesias, dyskinesias and parakinesias, which showed different levels of intensity in the individual parts of the body. He also documented on film the psychomotor disturbances in focal illnesses of the brain; the results were remarkable documentaries on ‘Motor disturbances in the mentally ill’ (Kleist and Herz, 1926/27), some of which are still available.8

The findings of Kleist’s investigations were published in several papers (Kleist and Driest, 1936; Kleist, Leonhard and Schwab, 1940; Schwab, 1938). In his 1943 paper he gave a comprehensive classification of the different types of catatonias. On the basis of his clinical research over more than three decades, he differentiated between akinetic (i.e., rigid), parakineti (i.e., ‘foolish’ or grimacing), stereotyped (i.e., manneristic), iterative (i.e., stuporous or periodic), prosektic (i.e., proskinetic) and negativistic forms of catatonias. Notably, Kleist associated akinetic and parakinetically catatonias with pathologically diminished and increased psychokinetic stirrings, respectively, whereas he interpreted the core symptoms of the negativistic or prosektic catatonias (such as automatic motion obedience) as indicating pathological strivings. Pure motor negativism, on the other hand, was not considered pathognomonic for catatonias because Kleist had observed and described it in other illnesses presenting with psychomotor apraxias as well. Incidentally, this also holds true for automatic motion obedience. However, any of the catatonic signs and symptoms were, according to Kleist, not experienced passively but rather ascribed to the self and commonly misconceived as if they could be held back by the patient. Kleist and Leonhard furthermor
separated speech-inactive (i.e., sluggish) and speech-prompt (i.e., voluble) catatonia \[sprachträge und sprechbereite Katatonie\], where the patients were either overly lethargic (reluctant to respond at all) or responsive to being addressed. For both varieties, Kleist explicitly acknowledged Karl Leonhard as their inaugurator. For all forms of ‘mental system illnesses’, Kleist assumed that they could occur both in a ‘pure’ and in a ‘compound form . . . as in amyostatic lateral sclerosis’ (Kleist, 1943: 7).

It was during his Frankfurt period that Kleist started involving his team members in publication matters, especially in the extensive follow-up investigations on catatonias, and also on ‘affective (hebephrenic), paranoid, and incoherent forms’. Thus, the ‘Frankfurt Neuropsychiatric School’ (Figs 5 and 6) was established. Besides Edda Neele (b. 1910), Ernst Herz, Ernst Fünfgeld, Hans Erich Schwab, Clemens Faust (b. 1913), Elfrida Albert (1921–88), it was above all Karl Leonhard who acquired a reputation. Kleist appointed him as senior psychiatrist and neurologist in 1936. Leonhard had previously gained a strong clinical background during his Erlangen period and during his 4 years of work at the mental asylum in Gabersee near Munich. Here he had the opportunity to observe many patients suffering from chronic schizophrenias and to analyse systematically the course of their
Fig. 6. Karl Kleist and the Frankfurt Neuropsychiatric School, based on Kolle's (1964) genealogy, and including the Wernicke-Kleist-Leonhard connection.
illness for a longer period of time. Based on these studies and observations, Leonhard (1936) submitted his thesis on schizophrenias and those characterized by primary deficit syndromes, for qualifying as a university lecturer. As a result, he was appointed in the same year, and in 1944 was awarded a personal chair. Thus, the foundation of the Wernicke-Kleist-Leonhard School was further strengthened (Beckmann et al., 2000; Lanczik and Beckmann, 1995).

11 Reflections on colleagues: Kleist’s reviews of books by Bleuler, Bumke and Magnus

Kleist (1924) wrote a review on the fourth edition of Bleuler’s ‘Textbook of Psychiatry’ and, in the next year, one on the second edition of Bumke’s ‘Textbook of Mental Illnesses’. With these essays, Kleist analysed and gave his opinion on two standard works of contemporary psychiatry. He acknowledged Bleuler’s hypothesis that schizophrenias formed a group of illnesses, but criticized the fact that Bleuler implicitly included cases of melancholias, manias, motility psychoses, paranoias and hypochondriacal psychoses in this group. Instead Kleist referred to neurological system illnesses (heredodegenerations) and suggested this term as a trendsetting concept to explain manifold forms of psychoses.

Kleist’s review (1925a) of Bumke’s textbook was eight pages long. He expressed scepticism of Bumke’s basically psychological approach and suggested that the future lay with brain-pathological concepts. However, Kleist explicitly acknowledged the mastery of Bumke’s ‘graphic, realistic descriptions of abnormal people and states’ and pointed to the chapter on ‘constitutional nervousness’ as the most successful and most perceptive part of the book. He concluded (p. 418) that a major feature of the work was Bumke’s opposition to ‘the limitless extension of the concept of schizophrenia, especially as proposed by Bleuler’. On the other hand, Kleist strongly opposed Bumke’s theories on catatonias, involutional paranoia and on hebephrenias, suggesting his own concepts as an alternative.

In Kleist’s review (1926a) of Rudolf Magnus’s (1873–1927) remarkable monograph on ‘The Body’s Stance’, he revealed his profound knowledge of topical and functional neurology, the specific methods of examination, neurological signs, reflexes and syndromes, thus showing his undisputed and unchallenged mastership as a clinical neurologist. Otherwise he would not have been able to write statements such as: ‘the point is to distinguish decerebrate rigidity with tonic neck and labyrinth reflexes from pallidal and nigral rigidity, which have not yet been shown in animals, but in human beings’ (p. 85). Kleist’s clinical, neurological and psychopathological mastery, as well as his ability to link disturbances to localized brain disorders, was due to the fact that he examined all newly admitted patients himself. He also established the diagnoses and headed the daily rounds, which usually lasted
until late in the afternoon. In his book of diagnoses, he noted down all clinical findings and remarks on the course of the individual illnesses.

12 Improved facilities at the new ‘Department for the Emotionally and Nervously Ill’ in Frankfurt

Since he started his work in 1920, Kleist had made efforts to improve the situation in the wards, laboratories and administrative offices of his department. Due to the fortunate circumstance that he was offered the chair of psychiatry at Leipzig University in 1923, which he, however, did not accept, he was granted extrabudgetary funds, which he could then use to realize some of the most urgent reconstructions he intended.

Four years later, Kleist presented – to the administrative bodies of both the City of Frankfurt and the university – his concept of a totally new hospital to be erected on a new site. The hospital, as Kleist imagined it, was to be both an asylum-like hospital based on a strong department for newly admitted patients and a research institution. The major point in his concept, however, was that the future department had to serve his striving to ‘combine psychiatry and neurology’ and to correspond to ‘my basic psychiatric beliefs’ (Kleist, 1932: 441). The hospital was designed to house 250 patients with enough facilities to meet ‘the social and therapeutic needs as well as the diagnostic, scientific and teaching requirements including forensic examination of section material’. As he saw it, the stay in the ward should extend to more than four to six months in order to ‘better describe melancholias and manias, curable confusions, motility psychoses, the acute stages of catatonias and schizophrenias both in their course and their duration’ (Kleist, 1932: 440, 442).

According to Kleist’s plans, the new hospital had specialized wards for psychiatry, neurology and brain pathology. Furthermore, there was a separate ward for children, which was not yet common practice at that time. Together with the laboratories and the administrative offices, the pavilion-style hospital occupied an area of 4.75 hectares (about 12 acres), and was situated in the midst of woods and gardens in Niederrad. At the time of its opening in 1930, the new Frankfurt hospital was one of the most modern and up-to-date mental health institutions in Europe. The Bauhaus architect Martin Elsässer (1884–1957) described the commission and its realization (Elsässer, 1932). Matching form to function, he produced an architecture and functionality which was designed to meet the challenges of the subsequent years and decades. One year later, however, everything was going to change.

13 Kleist, the Frankfurt department and Nazism: 1933–45

When Adolf Hitler (1889–1945) and his National Socialist German Workers’ Party, NSDAP, took control in Germany on 30 January 1933, German
society was already pervaded with racist ideas. A flood of laws helped to establish and strengthen the Nazi dictatorship. With regard to mental health care, the Civil Service Restoration Act of 7 April 1933 gave free reign to the expulsion of Jewish doctors and scientists from hospitals, universities and other research institutions. On 14 July the Nazi government passed the Act for the Prevention of Offspring Suffering from a Hereditary Disease [Gesetz zur Verhütung erbkranken Nachwuchses] as a result of which 350,000–400,000 forced sterilizations were carried out. This Act also defined which illnesses were to be regarded as hereditary: congenital feeble-mindedness (namely oligophrenias), schizophrenia, manic-depressive illness, hereditary epilepsy, St Vitus’ dance (Huntington’s chorea) and, furthermore, hereditary blindness and deafness, severe physical deformities and severe alcoholism. The passing of the Act paved the way for the so-called T4 action programme, T4 standing for Tiergartenstraße 4 in Berlin, the address of the head office for this euthanasia programme. Hitler authorized it to implement this policy in a letter deliberately antedated to 1 September 1939, the first day of World War II (see Friedlander, 1995; Klee, 1983; Müller-Hill, 1984). Although the programme was officially terminated on 24 August 1941, again on Hitler’s personal command, at least 200,000–300,000 mentally ill adults plus at least 5,000 children fell victim to this inhuman policy.

The whole euthanasia programme was headed and managed by Hitler’s aide, State Chancellor Dr Philipp Bouhler (1899–1945), and actively supported by representatives of the medical profession, among them: Professors Karl Brandt (1907–47, hanged), Secretary of State for public health care and Hitler’s private physician; Hermann Paul Nitsche (1876–1948, hanged); child and adolescent psychiatrist Hans Heinze (1895–1983); adult psychiatrist Werner Heyde (1902–61); and the neuropsychiatrist Maximinian de Crinis (1889–1945, suicide), who had been appointed as Bonhoeffer’s successor at Berlin’s Charité in 1938. The main aim of the programme was eugenics and ‘preventing negative influences on the race from being transmitted’. To achieve this it became compulsory for any physician to report all patients suffering from the above-mentioned illnesses to the relevant institutions which then commissioned another medical certificate and forwarded the case to the so-called Courts of Genealogical Health [Erbgesundheitsgerichte]. The brains of mentally ill patients who had been killed were made available for ‘interested specialists’. Many German psychiatrists and neurologists as well as eugenicists were actively involved in the realization of the euthanasia programme. Among them were Eugen Fischer (1874–1964), the first director of the Emperor William Institute for Anthropology, Human Genetics and Eugenics founded in 1927, as well as Baron Otmar von Verschuer (1896–1969) who succeeded him in 1942. The German Research Institute for Psychiatry in Munich was also actively involved via the director of its Institute for Genealogy, Demography, Genetic and German Race Issues, Ernst Rüdin (1874–1952; see Peters, 1996). Anatomists (for details,
see Aumüller and Grundmann, 2002; Lampert, 1991; Malina and Spann, 1999) and neuropathologists such as Julius Hallervorden (1882–1965), who collaborated with Heinze, and Berthold Ostertag (1895–1975) were also involved in these gruesome activities or at least tolerated them without resisting (for details, see Hohendorf, Roelcke and Rotzoll, 1996; Holdorff and Hoff, 1998; Leonhardt and Foerster, 1996; Peiffer, 1991). Indeed only a few representatives of the medical profession voiced opposition (Gerrens, 2001; Peters, 1999). Notably, even Bleuler had advocated sterilization of patients suffering from schizophrenias from a perspective of ‘racial hygiene’ as early as in 1911 (Bleuler 1911: 382).

At quite an early date, Kleist had dealt with those aspects of the Nazi plans that concerned his speciality. After a convention of the Doctors’ Club in Frankfurt on 6 February 1933, he published an article on ‘Eugenic sterilization from the psychiatric point of view’ (Kleist, 1933) in the official journal of the Medical Association of the Hesse-Nassau Province. In accordance with the population-genetic Hardy-Weinberg equilibrium discovered in 1908, Kleist considered forced sterilization untenable from a scientific point of view. Therefore, he unambiguously disapproved of this form of intervention as such and tried to oppose it as far as possible. He did not change his opinion despite several comments by his colleagues, for example, Hans Luxenburger (b. 1894) who commented on the passages in the new law that were most relevant to psychiatrists in an article (1934) in the prestigious journal Nervenarzt. Bonhoeffer had expressed his views on this matter as early as 1924, with others to follow (see Seidel and Neumärker, 1989).

The way in which the arguments continued, above all their tone and sharpness, then changed drastically, as exemplified by the talks given at the second annual convention of the Association of German Neurologists and Psychiatrists, as this compulsory union was called at the time. The meeting took place from 22 to 25 August 1936 at Kleist’s own place of work in Frankfurt/Main. Besides greeting his fellow psychiatrists and neurologists, the first speaker Rüdin (1937: 5) paid tribute to ‘the man who innovated . . . our views on medicine serving race eugenics’ by shouting ‘Unserem Führer Adolf Hitler Sieg Heil’. Other leaders were acknowledged similarly, and the expected reactions were received. Surprisingly, the discussions that followed were quite practical and, indeed, primarily technical. Kleist (1936) presented his comprehensive account on ‘Brain pathology and its significance for neurology and psychiatry’ at the session of the psychiatric section on 24 August. In his own characteristic style, he summarized three decades of his work on specific neuropsychological phenomena, such as visual and alogical disturbances of mental processing, with especially the latter being ascribed by Kleist to the frontal lobe, or acalculia, for example. He concluded that ‘Thinking as well as language and acting are of dual nature comprising sensory (receptive and ordering) and motor capacities’ (Kleist, 1936: 178). As regards the ‘psychopathology of the ego capacities’ Kleist referred to the
‘autopsyche’ [Selbst-Ich] in contrast to the ‘koinopsyche’ [Gemeinschafts-Ich],
comprising the ‘moral and ethical attitudes and behaviour patterns of
communal living’, and the ‘holopsyche’ with the mundane and religious
attitudes [Welt-Ich und religiöses Ich], which meant the ‘mental integration of
the individual into the totality of the world’. Bearing in mind the
contemporary circumstances, one may gain the impression that Kleist – true
to his Calvinist faith and feeling of responsibility, and also strongly affected
by his experiences in World War I – did not merely want to present his
neuropsychiatric œuvre. Instead, by speaking about brain illnesses, he aimed
to identify and warn of the destructive forces directed against the ‘Self-Ego’,
‘Community-Ego’ and ‘World-Ego’ of mentally ill and handicapped people.

Kleist’s talk sparked a critical discussion in which Willibald Scholz
(1889–1971), Johannes Lange (1891–1938), and Rudolf Thiele (1888–1960)
made considerable contributions (all 1937); Oswald Bumke (1877–1950) and
Hugo Spatz (1888–1969) also took part. Above all, the heuristic significance
of Kleist’s work was acknowledged. Kleist pointed out (1936: 337) that
‘since my first brain pathological works, which were published more than 30
years ago, I have never been . . . a supporter of rigid localization’. He also
marked the very term ‘localization’ as unsatisfactory and insufficient, since
‘quite often certain capacities or disturbances are not bound to a specific
location, but rather to long or otherwise extended structures in the nervous
system’. In this context Kleist again referred to neurology where ‘. . . e.g.
spastic paralysis of the central gyrus or the spinal cord is bound to the same
structures of pre-central cortex cells together with their neurites’. Refuting
Bumke’s reproach that his theories would be rather materialistic, Kleist
argued that his notions were ‘neither materialistic, nor idealistic, nor of any
other philosophical nature, but rather simple attempts to trace intercon-
nections between nervous and mental processes on the one hand and the
structure of the nervous system on the other – and to utilize these findings
for medical interventions’ (p. 341).

On the occasion of his 60th birthday on 31 January 1939 Kleist’s life and
work were appreciated in a special ‘Festschrift’ (Karl-Kleist-Festschrift,
1939) comprising papers by his students at the Frankfurt school and others.
It also contains a bibliography of all of Kleist’s works, including talks he gave
and films he made between 1903 and 1938. In the eulogies, Kleist’s ‘highly
acknowledged and successful research’ was acclaimed. Eight months later, on
1 September, the Nazis started World War II by invading into Poland.

However, as early as 1933 the political and social situation in Germany
had become more critical. Kleist himself faced strong criticism for employing
a considerable number of Jewish doctors such as Strauss, Alexander, Herz,
Merzbach, Rosenstein and Fleischhacker, and for continuing to treat Jewish
patients alongside Germans. He had, however, set up separate waiting rooms
for them. His department was often denigrated as ‘Jewish clinic’. Despite his
strong commitment, for which he was also reverentially called the ‘Niederrad’s
King of the Jews', Kleist could not prevent others from making reports to the police, with the consequence that his Jewish employees were dismissed. Many of them then emigrated from Germany.

Kleist also tried to do his best for his patients and those at other mental institutions in Hesse which he inspected. Registering how differently patients were treated and to what extent food rations diminished in order to reduce the number of 'useless eaters', he made sharp complaints to the Nazi bodies, whereupon his inspections were prohibited.

Apparently Kleist himself was denounced and efforts made to dismiss him. At least this is what we read in a letter Kleist wrote to de Crinis, his Berlin colleague, on 25 September 1939; this letter is in the latter's personal file (de Crinis, unpublished). Von Stockert (1899–1967), one of Kleist’s employees and a well-known child neuropsychiatrist, told colleagues that Kleist was under heavy pressure and claimed that 'one more incident would suffice to cause me [i.e., Kleist] to fall.' Kleist had even heard that his 'letter of dismissal had already been signed and only you [de Crinis] have prevented it from being dispatched.' For that Kleist expressed his gratitude to de Crinis. However, in his answering letter dated 27 September, de Crinis rejected this thanks, stating that he had not interfered in any matter, and this was acknowledged by Kleist on 19 October 1939 (Fig. 7). This correspondence emphasizes how important de Crinis was thought to be by his colleagues and
how much influence and power were ascribed to him. Both Kleist and de Crinis used the common complimentary ending ‘Heil Hitler!’ in their letters.

Despite his disagreements with official Nazi directives, Kleist, like many doctors in the Third Reich, became a member of the NSDAP. He was also appointed as a member of the Frankfurt Court of Genealogical Health [Erbgesundheitsgericht] in 1940. We do not know how many and what particular sentences were passed during Kleist’s attendance at the Frankfurt Court of Genealogical Health, but according to some sources Kleist managed to enact indemnity payments to some of the victims of forced sterilizations by the Third Reich (Bartsch, Neumärker and Beckmann, in press). Kleist’s views on Nazism and Nazi Politics were, in part, also described by Kaendler et al. (1995). After the German attack on the Soviet Union on 22 June 1941, Kleist was appointed psychiatric adviser of Military District IX in Kassel with the rank of colonel, and as such headed the neurological and psychiatric department of the military hospital with Associate Professor Dr Heinrich Kranz (1901–79) acting as his deputy. Both he and another fellow psychiatrist at the hospital, Gerhard Koch (1913–99), have left first-hand accounts not only of their own work but also of Kleist’s attitudes during that time – both as a man and a physician. Kranz, who also had his own neurological office in Frankfurt, confirmed (1977: 203) that ‘in view of the killing of mentally ill patients [he tried his best] not to send patients suffering from a psychotic disease to the asylums in the vicinity, but to Kleist’s university hospital, where I knew that diagnoses that put patients at risk according to the eugenic law were made as seldom as possible’. It means that at Kleist’s hospital – as at other institutions – diagnoses and medical histories were even forged in order to ‘save’ patients from the cruel ‘euthanasia-action’. Koch also provided examples of how Kleist tried to avoid the diagnoses of schizophrenias or manic-depressive illnesses in his medical certificates for the Court of Genealogical Health or the Court Martial. Instead he spoke of marginal or involitional psychoses, or substituted ‘symptomatic, non-hereditary’ for ‘endogenous epilepsy’. Furthermore, Koch gave evidence of how Kleist cautioned other medical staff not to diagnose ‘hereditary neurological illnesses’ and how he authored his own ‘Diagnostic guidelines and assessment scales’ and ensured they were applied (Koch, 1993: 173–92). When the Anglo-American airforce bombed the German Reich, the city of Frankfurt and Kleist’s hospital were affected. When patients were to be evacuated to the Eichberg asylum, known as a major T4 institution, Leonhard and Kleist interfered and succeeded in preventing this from happening. Instead the patients were transferred to the Goddelau psychiatric hospital (Leonhard, 1995: 63). Nevertheless, the situation grew more and more acute.

Germany’s unconditional surrender on 8 May 1945 marked the end of World War II for Germany. Afterwards the whole extent of terror and violence, and details of the systematic killing of mentally ill and handicapped
people, were revealed. The question of who was responsible and who should be punished were firmly on the agenda, and the resolution of these questions took many forms. The Nuremberg War Crimes Trial and the Medical Crimes Trial of 1946–7 were two attempts to consider the involvement of psychiatry, neurology and neuropathology in Nazi affairs and actions (Peiffer, 1998a, 1998b). Leo Alexander (1905–85) acted as an expert consultant to the counsel for the prosecution in the Nuremberg Medical Crimes Trial, as head of the eponymous commission. Kleist, too, had to undergo interrogation and face trial. He was, however, one of the few physicians explicitly named by Alexander Mitscherlich’s (1908–82) final report of the Task Force of West German General Medical Councils on the Nuremberg Medical Crimes Trial as having opposed the inhuman medical practice of ‘euthanasia’. Thus, Kleist was rehabilitated and could again take up the directorship of ‘his’ hospital, which had meanwhile been run by his colleague Hans Schwab (1910–76).

Overall, Kleist seems to have been one of the few German physicians who continued to treat Jewish patients, who employed Jewish colleagues as long as possible and supported them after their enforced departure from his hospital, and, in particular, voiced profound criticism of the policies of ‘eugenics’ and ‘euthanasia’. By the same token, however, he may be considered a typical representative of German conservative academics who remained focussed on their speciality and ambitions and who gave up the democracy of the Weimar Republic without any effective resistance. He did not at all embark on the Nazi ideology of racial and constitutional degeneration hypotheses but, on the other hand, he did not appropriately recognize and acknowledge the evolution, extension and consequences of this instrument of power of Nazi dictatorship. From a retrospective point of view, he seems to have remained too technical on these issues, and this doomed him to failures, too. In contrast to many of his contemporaries, however, he effectively maintained his fundamental humanistic attitude, and this had some practical impact for his patients and employees.

14 The conflict of a new beginning vs. traditions: 1945–60

The new beginning turned out to be rather difficult. Although the hospital was severely damaged, medical care had to be guaranteed. Only after the hospital’s reconstruction could research projects be tackled again. As far as scientific work was concerned, Kleist was able to carry on successfully from where he had left off, and he developed visions for the future by combining traditions with the prospects of a new beginning. This rather positivistic stance became obvious in his talk on ‘Progress in psychiatry’ (Kleist, 1947) given at the Senckenberg Society of the Natural Sciences on 15 February 1947. The historic association of the Senckenberg Society goes back to the eighteenth century, when physician Johann Christian Senckenberg (1707–72)
donated his garden together with a small hospital to the Frankfurt medical professionals. When Kleist delivered his speech, he continued the tradition set by his predecessors Edinger and Karl Weigert (1845–1904), who had read brilliant lectures on the central nervous system at the same place. In his talk, Kleist reviewed the history of his discipline since the turn of the century, acknowledging the achievements of Wernicke and Kraepelin. He also described his own contribution and those of his collaborators in shedding light on the ‘great variety of symptoms, courses and prognoses’ in the field of psychoses. He pointed out the relevance of these findings and the progress they marked in the evaluation of this group of illnesses. In contrast, ‘Kraepelin’s convenient, but simplified, description had become deceptive, and even restrictive after it had become ossified as dogma’ (Kleist, 1947: 21). Kleist summarized, ‘Today we have gained more safety in the diagnostic and practical interpretation of individual cases, more suitable to the requirements and necessities of life’. Analysing the therapeutical concepts available, he concluded that ‘There is no need for us to be pessimistic’ (p. 22). In the same year, the talk was licensed for printing by the US army’s censor’s office (licence No. US-W-1045), and 3,000 copies were published on 1 June 1947. It seems as if one of the main purposes of the paper was to give a few words of encouragement and assurance to German psychiatry which was on the edge of the abyss. Of course, such a purpose was arguably appropriate at the time, and Kleist’s talk may well be considered overly optimistic – also in terms of the therapeutic perspectives promised. Notably, Kleist neither addressed the issues of the recent crimes of euthanasia and eugenic sterilizations nor referred to the participation of psychiatrists as physicians or psychiatry as a discipline. Overall, he had decided to embark primarily on his specialization as a pioneer of neuropsychiatry, and thus he shared the fate of various German academics both in his involvements in the Third Reich (as discussed above)
and the period immediately afterwards. However, in order to help to continue the old traditions successfully, Kleist founded the Frankfurt Institute for Research in Brain and Psychopathology. Soon after, on 27 July 1950, Kleist retired (Fig. 8), giving his farewell lecture on ‘Brain and soul’ (Kleist, 1951b). However, he continued to be active in research and other work.

To honour his life and works and to acknowledge his contributions to the development of the neurosciences, Kleist was awarded several prizes. The City of Frankfurt bestowed on him the rank of an honorary senator. He was also given an honorary doctorate by the Medical Faculty of Freiburg im Breisgau University and honorary membership by the Interstate Postgraduate Medical Association North America. In 1952 he was awarded the Erb Commemorative Coin, the highest honour for neurologists in Germany, presented to him by Nonne. In November 1951 Kleist and Vogt were informed that Egas Moniz (1874–1955), Nobel Prizer winner of 1949, had proposed the two of them for the 1952 Nobel Prize on behalf of the Spanish and Portuguese psychiatrists and neurologists (de Barahona Fernandes, 1951; Richter, 1996: 400). However, the prize was awarded to Selman Abraham Waksman (1888–1973), who had discovered streptomycin.

At General Secretary Henri Ey’s (1900–77) invitation, Kleist took part in the discussions of the report on lobotomies and topectomies at the International Congress of Psychiatry in Paris in September 1950. He (Kleist, 1951a) mentioned the case of a patient suffering from parakinetic catatonia where leukotomy had apparently led to a considerable improvement of her symptoms, but he recommended great caution with such procedures. As Pichot (1992) described in great detail, the French organizers of the convention were keen on inviting their German colleagues in order to restore the international scientific exchange which had been interrupted by the Nazi period.

In the early 1950s, Kleist (1953) exemplified once more his attempts to classify and systematize. He differentiated between three basic types of ‘neuropsychiatric illnesses’: ‘allogenous, originating from the outside world; somatogenous, coming from within the body; and neurogenous illnesses, that are inherent in the nervous system itself’ (p. 551). At the same time, he proved his sense of rationalism by acknowledging the fact that ‘Each classification is valid for a particular period of time only and will sooner or later become outdated by newly gained knowledge’ (p. 526). In his remarkable ‘Systematics of schizophrenias in the light of brain pathology’, Kleist (1957) stuck to principal psychopathological phenomena which he integrated into complexes of symptoms. He regarded these of much higher importance than the classification principles suggested by the Zeitgeist (Kleist, 1960). The later DSM and the ICD may eventually come to acknowledge Kleist’s approach (see, for example, Maj, 1998).

Kleist died of a heart attack on 26 December 1960, five weeks before his
82nd birthday. Obituaries such as those by Leonhard (1961a, 1961b), Faust (1961, 1962) and Koch (1961) highlighted Kleist’s importance for the development of neuropsychiatry. Hassler (1961: 2489) acknowledged Kleist’s functional structuring of the cortex as ‘the most comprehensive and most well-founded system of cortical localization’ (see also Bartsch et al., 2000; Bartsch et al., in press).

15 The relevance of Kleist today

In the last years of his life Kleist himself witnessed an ever-increasing and above all positive consideration of his theories. Thus Klages (1958), who was working under Kretschmer in Tübingen, presented his comparative analysis of the psychopathology of fronto-orbital brain lesions and of hebephrenias. He pointed out the desintegration of psychomotor phenomena in both illnesses and also similar changes in the affective and associative capacities. Furthermore, he acknowledged the increased instability, susceptibility and vulnerability of one of the most recent – from an evolutionary point of view – parts of the cerebral cortex. Kleist had also elaborated extensively on the impact of fronto-orbital brain lesions and, based upon these findings, he may indeed have developed the most sophisticated concept so far available of a differentiated psychopathology of the frontal lobe and the fronto-orbital brain. It was Kleist who differentiated frontal akinesia from akinesia of the brain-stem. He located psychomotor drive and stamina in the sense of cortical psychomotorics to the frontal lobe, whereas psychomotorics featuring akinetic-hyperkinetic phenomena, echopraxia, echolalia and command automatism were ascribed to the brain-stem (mostly to the striatum).

Kienle (1959), another member of Kretzschmer’s team, referred to Kleist in his analysis of the ‘Courses of catatonic symptom complexes’. He pointed out that basic catatonic phenomena in a way resemble damage to the pyramidal tract. More specifically, he discovered that catatonic motor disturbances and spastic motor disturbances mirrored each other inversely in their occurrence and distribution. His description emphasized that negativism, akinesia and catalepsy spread from the lower jaw via the throat, trunk and the proximal extremities to the distal parts of the limbs. The subsiding of catatonic signs proceeds in the reverse order. After Kahlbaum’s classic description of catatonia, which was in fact primarily related to cycloid and particularly motility psychoses, and its ongoing discussion, e.g., by Kraepelin, Bleuler, Bonhoeffer and Kleist, the topic somehow disappeared from the more recent German literature (see Pauleikhoff, 1969) and especially from the Anglo-American literature; Mahendra (1981) asked the question ‘Where have all the catatonics gone?’ It is remarkable that until the article ‘Catatonia: re-awakening to a forgotten disorder’ (Rosebush and Mazurek, 1999), catatonias were regarded as a ‘behavioral neurologic syndrome’ (Taylor, 1990) or simply as a ‘movement disorder’. It is noteworthy that
American authors such as Carroll (2001) have since addressed ‘Kahlbaum’s catatonia revisited’. Astonishingly, however, Kleist and Leonhard seem mostly to have escaped their attention.

As McGuire (1996) has pointed out, remarkable similarities and analogies are revealed if one compares the different localizational approaches to mental illnesses, starting from Wernicke. First, there was Wernicke's sejunction theory whereby he understood the disruption of associations or cortico-cortical functions. Thereupon, Kleist based his psycho-pathological and brain-localizational descriptions of different forms of psychoses by analogy with the concept of heredodegenerations in neuro-logical illnesses. Kleist emphasized the importance of the frontal lobe and of the fronto-orbital brain, in particular, of the brain-stem up to the striatum, the pallidum, the thalamus, and of the diencephalon, the gyrus cinguli and the left temporal lobe. Norman Geschwind (1926–84) inaugurated his disconnection paradigm to explain neuropsychiatric disturbances in 1965 (see Absher and Benson, 1993).

With respect to schizophrenic psychoses, contemporary theory of changes in brain structure suggests that they are related to developmental, perhaps also neurodegenerative, factors that cannot be associated with one particular part of the brain. Lewis (2002), McGlashan and Hoffman (2000) and others suggest the combination of a frontal network disturbance affecting Brodmann's areas 9, 10 and 46, a temporal one based in area 22, plus a parietal disturbance affecting areas 39 and 40 in connection with a local disconnectivity of the neuronal network of the heteromodal association cortex. In recent papers, disturbances in other areas of the brain such as the basal ganglia (e.g., Menon et al., 2001), the thalamus (e.g., Danos et al., 2002; Gilbert et al., 2001), and of cerebellar structures in connection with irregular Purkinje cell patterns (e.g., Loeber, Cintron and Yurgelun-Todd, 2001) have been identified. Furthermore, defective limbic structures of reduced volumina and cross-sectional extensions, diminished cell numbers and degenerated cytoarchitectures, as well as reduced cell numbers and shrunken cross-sectional appearance of the thalamus and basal ganglia in general (including the caudatum, putamen, and the pallidum), have been detected. Finally, other studies have revealed a reduced number of axons in the nucleus accumbens, degenerations of the substantia nigra, the locus coerules and the pedunculopontine nuclei and also a reduced density of cells in the prefrontal cortex. All these findings indicate clearly that there is no singular specific substrate for schizophrenias as there is for Alzheimer's and Huntington's diseases. Since Kleist acknowledged many different mental system diseases of the brain by analogy with the heredodegenerations, he cannot be accused of one-sidedness in his approach. Teichmann (1990: 267) summarized the correlations between the manifold forms of schizophrenias and their brain-anatomic substrate according to Kleist (see Table 1). Notably, there is no one-to-one correspondence between the entities as
TABLE 1. Correlations between the manifold forms of schizophrenia and their brain-anatomic substrate (Teichmann, 1990: 267)

<table>
<thead>
<tr>
<th>Hebephrenias</th>
<th>Correlations</th>
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<tbody>
<tr>
<td>silly (i.e., foolish) hebephrenia</td>
<td>diencephalon</td>
</tr>
<tr>
<td>depressive (i.e., eccentric)</td>
<td>diencephalon</td>
</tr>
<tr>
<td>apathetic (i.e., shallow, insipid) hebephrenia</td>
<td>diencephalon orbital region of frontal lobe</td>
</tr>
<tr>
<td>autistic hebephrenia</td>
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<table>
<thead>
<tr>
<th>Catatonias</th>
<th>Correlations</th>
</tr>
</thead>
<tbody>
<tr>
<td>drive-deficient (i.e., sluggish, speech-inactive, or amotivated) catatonia</td>
<td>frontal lobe</td>
</tr>
<tr>
<td>akinetic (i.e., rigid) catatonia*</td>
<td>pallidum, thalamus</td>
</tr>
<tr>
<td>parakinetic (i.e., grimacing) catatonia</td>
<td>striatum, thalamus</td>
</tr>
<tr>
<td>negativistic catatonia</td>
<td>brain-stem</td>
</tr>
<tr>
<td>proskinetik (i.e., prosektic) catatonia</td>
<td>–</td>
</tr>
<tr>
<td>speech-prompt (i.e., voluble) catatonia</td>
<td>–</td>
</tr>
<tr>
<td>stereotyped (i.e., manneristic or affected) catatonia</td>
<td>striatum</td>
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<table>
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<tr>
<th>Paranoid schizophrenias</th>
<th>Correlations</th>
</tr>
</thead>
<tbody>
<tr>
<td>phantasiophrenia</td>
<td>diencephalon</td>
</tr>
<tr>
<td>(progressive, expansive) confabulosis</td>
<td></td>
</tr>
<tr>
<td>(progressive) hallucinosis</td>
<td></td>
</tr>
<tr>
<td>(progressive) somatopsychosis</td>
<td>thalamus</td>
</tr>
<tr>
<td>(progressive) autopsychosis</td>
<td>gyrus cinguli</td>
</tr>
<tr>
<td>(progressive, expansive or 'revelatory') inspiration psychosis</td>
<td></td>
</tr>
<tr>
<td>(progressive) psychosis of influencability (e.g., of reference)</td>
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<table>
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<tr>
<th>Confused schizophrenias</th>
<th>Correlations</th>
</tr>
</thead>
<tbody>
<tr>
<td>incoherent schizophrenia</td>
<td>diencephalon</td>
</tr>
<tr>
<td>paralogic schizophrenia</td>
<td>occipital lobe</td>
</tr>
<tr>
<td>schizophrenia*</td>
<td>left temporal lobe</td>
</tr>
</tbody>
</table>

Note. We have added, in brackets and italicized, translations of extended nosological terms used either by Kleist or later by Leonhard to designate the various schizophrenias.

* Teichmann (1990) does not include Kleist's unsystematic or recurrent confused schizophrenia (i.e., cataphasia).
Kleist and Leonhard have perceived them. Kleist’s akinetic catatonia, for example, comprises mostly periodic catatonia cases in the sense of Leonhard. The same holds true for Kleist’s iterative-stuporous catatonia which was not cited by Teichmann (1990). Besides manneristic movements, Leonhard has also emphasized omission mannerisms in stereotyped or manneristic catatonia. Mannerisms, however, are also common in eccentric hebephrenias, particularly the combined forms, which substantiates the French concept of ‘hebedocatatonias’. Kleist finally recognized Leonhard’s notion of differentiating genetically higher loaded unsystematic schizophrenias inclined to some bipolar features from developmentally more conspicuous systematic schizophrenias of an insidious onset and course. Kleist himself came to refer to unsystematic periodic catatonia, for instance. However, Kleist never abandoned the pursuit of his own conceptualization of catatonias and schizophrenias, in general, and this is also exemplified by his insisting on the existence of systematic (speech-) confused schizophrenias. In another recent

### TABLE 2. The cingulum: analogies between the views of Kleist (1934a) and Devinsky et al. (1995)

<table>
<thead>
<tr>
<th>Kleist, 1934a</th>
<th>Devinsky et al., 1995</th>
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<tr>
<td>‘The functions of the cingulum are still unknown. However, the kind of connecting fibres can give us some hint. For the cingulum is connected to the thalamus by ascending fibres...’; ‘sensory impressions... can get to the mamillary body and further to the nucl. ant. thalami and from there to the cingulum...’ (p. 1163)</td>
<td>‘The anterior cingulate cortex... has numerous projections into motor systems. The anterior executive region is subdivided into “affect” and “cognition” components. The affect division includes areas 25, 33 and rostral area 24, and has extensive connections with the amygdala and periaqueductal grey, and parts of it project to autonomic brainstem motor nuclei... The cognition division includes caudal areas 24’ and 32’, the cingulate motor areas in the cingulate sulcus and nociceptive cortex. The cingulate motor areas project to the spinal cord and red nucleus and have premotor functions...’ (p. 279)</td>
</tr>
<tr>
<td>‘Thus, the cortex of the cingulum and of the fronto-orbital brain obviously contains a sensory area of affective inner sensations...’ (p. 1165)</td>
<td>The following clinical examples are given:</td>
</tr>
<tr>
<td>‘But there are also corticofugal fibres going from the orbital cortex and the gyrus cinguli, that form part of the corticonuclear fibres, from which motor reactions to visceral sensations and other ego-inherent expressions can be derived...’ (p. 1165)</td>
<td>‘Anterior cingulate cortex epilepsy, tics, obsessive-compulsive behaviours, ... aberrant social behaviour ... The affect division of anterior cingulate cortex modulates autonomic activity and internal emotional responses... The anterior cingulate cortex is part of a larger matrix of structures.’ (p. 279)</td>
</tr>
</tbody>
</table>
overview on the ‘Neuropathology of primary mood disorder’ (Harrison, 2002), neural disconnections are also extensively discussed, but no reference at all is made to Kleist.

The cingulum may serve as another prominent example. Kleist dealt with the ‘Disturbances of ego capacities and their correlations with the fronto-orbital brain, the cingulum, and the diencephalon’ in a special chapter of his ‘Brain pathology’ (Kleist, 1934a). Some striking analogies can be established by comparing Kleist’s findings with those in the review ‘Contributions of the anterior cingulate cortex to behaviour’, published some 60 years later (Devinsky, Morrell and Vogt, 1995); see Table 2.

In a talk given as early as 1934, Kleist had set out in great detail the interconnections between ‘Personality and corporeality’ on one hand and brain pathology on the other (Kleist, 1935: 302); see Table 3. In his ‘Brain

### Table 3. Interconnections of brain pathology and the clinic of ‘Personality and corporeality’ (Kleist, 1935: 302)

<table>
<thead>
<tr>
<th>Personality</th>
<th>Inner person</th>
<th>Outer person</th>
<th>Interrelations of inner and outer persons</th>
</tr>
</thead>
<tbody>
<tr>
<td>‘Personal self’ [Selbst-Ich, autopsych or Self-Ego], ‘Municipal self’ [Gemeinschafts-Ich, koinopsyche or Community-Ego], ‘Mundane (religious)self’ [Welt- (religiöses) Ich, holopsyche or World-Ego]: (a) emotions; diencephalic stage (b) attitudes (convictions) and activities (character); cortical stage (fronto-orbital brain)</td>
<td>Personal attitudes, memories, feelings, abilities and skills, talents: Cortex</td>
<td>Self-experience: Gyrus cinguli and corpus callosum</td>
<td></td>
</tr>
<tr>
<td>Corporeality</td>
<td>Inner body</td>
<td>Outer body</td>
<td>Interrelations of inner and outer body</td>
</tr>
<tr>
<td>Bodily self [Körper-Ich, somatopsych] (Inner sensations and their entities): (a) diencephalic stage (b) cortical stage (gyrus cinguli)</td>
<td>Sensations and conceptions of the outer body (body-images; [Körperbilder]: cortex, especially parietal and occipital lobe</td>
<td>Gyrus cinguli and corpus callosum</td>
<td></td>
</tr>
</tbody>
</table>
Kleist's neuropathological and neuropsychological results such as those of his study on ‘Brain-pathological and localizational conclusions on hearing loss, deafness, and amusia’ (Kleist, 1928), carried out on the basis of Brodmann's cytoarchitecture and Vogt's myeloarchitecture, can be compared with recent findings on the temporal plane and its modular architecture (Griffiths and Warren, 2002): one is struck by the similarity of Kleist's findings to what is now referred to as spectrotemporal information processing. But again, Kleist is not cited. There are many more examples of this kind.

During his one and only visit to the Department of Psychiatry and Neurology at Berlin's Charité on 18 November 1957 – at Leonhard’s invitation – Kleist gave a talk to the Berlin Society of Psychiatry and Neurology (founded in 1868 by Griesinger) on the ‘Myeloarchitectural foundations of sensory aphasia and amusia’ (Kleist, 1959). Leonhard's study at the hospital was decorated by two photographs: one of Wernicke and one of Kleist (Neumärker, 1994). This is highly symbolic for Leonhard who succeeded in continuing and further developing the scientific heritage of these two men. Nowadays, this is the established objective and incentive for The International Wernicke-Kleist-Leonhard Society.

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ENDNOTES

1. On 1 October 1903 Bumm's assistant Gustav Specht (1860–1940) was appointed as Professor of Psychiatry and head of the Department of Psychiatry at Erlangen University. As late as 1927 neurology was integrated to form a single department. In 1937 Specht retired. It will be shown that Specht's and Kleist's ways were to cross again in Erlangen.

2. Karl Bonhoeffer (1868–1948) was the editor of the fourth volume ('Mental and Nervous Illnesses') of the 'Handbook on Medical Experiences during the World War of 1914/1918', to which he also contributed the chapter on the impact of war experiences on psychopathology and the aetiology of mental illnesses (Bonhoeffer, 1922). He had persuaded Kleist to write the relevant chapter on nervous diseases, but in fact this manuscript was not completed for many years and was published as a separate book (Kleist, 1934a).

3. This very successful book was first published in 1845 and reached its hundredth edition as early as 1876. More than 15 million copies have now been sold worldwide.

4. Hoche had published his paper in 1912, causing fierce and controversial argument which has continued to the present day (Schimmelpenning, 1990). Dening and Berrios (1991) edited and published an English translation of Hoche's article.

5. The emergence of the concept of schizoaffective psychoses in American psychiatry was investigated by Maj (1984).
6. Ernst Fünfgeld worked under Kleist as director of the histopathological laboratory in Frankfurt; in 1938 (the same year as de Crinis was appointed as Bonhoeffer’s successor in Berlin), he became head of the Department of Psychiatry at Köln University.


8. The film ‘Catatonia (psychomotoric akinesia and parakinetic hyperkinesia)’, 16-mm format, length 125 minutes, is available as a VHS cassette from the British Medical Association, Tavistock Square, London WC1 H9JP, UK. For further information, see Podoll (2000).

9. Alexander had worked as an assistant under Kleist between 1929 and 1931 and had been warned by him not to return to Germany after his stay in China. So Alexander saved himself by emigrating to the United States in 1933. In 1945 he returned to Germany where, by order of the US Army, he interviewed German medical professionals to establish how far they had been involved in Nazi crimes. Alexander also co-authored the Nuremberg Codex for Ethics in the Medical Sciences (Peiffer, 1998a: 101).

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