

Siberian brandy: Korsakoff syndrome

In the Western world, little is known about the life of Sergei Korsakoff. He never got around to writing his memoirs (he died of heart disease at the age of 46) and the biographical sketches which have appeared outside Russia are brief and lean toward hagiography.¹ The image they call up is that of a much-loved master, excellent teacher and fatherly counsellor, set against a background of overflowing lecture halls and waiting rooms still full of patients close to midnight. The information which is available pertains mainly to the public marks of his career: the dates and locations of his education, training and appointments – all in all, little more than the contents of a modern CV. What remains of Korsakoff in the collective memory of Western history of science consists of a handful of fragments and a gaping void: as if historians had been told to reproduce the memory of a Korsakoff patient.

Sergei Sergeivich Korsakoff was born in 1854 in Guss-Chrustallny, a small town some 250 kilometres east of Moscow. It was named after

¹ A. W. Snjeshnewski, 'Sergej Sergejewitsch Korsakow (1854–1900)' in K. Kolle (ed.), *Grosse Nervenärzte* (Stuttgart, 1963), vol. III, pp. 86–94. See also S. Katzenelbogen, 'Sergei Sergeivich Korsakoff (1854–1900)' in W. Haymaker (ed.), *The Founders of Neurology* (Springfield, 1970), pp. 311–14.

the glass and crystal factory which provided work for many of the inhabitants, including Korsakoff's father. At the age of 10, Sergei left home to study at a secondary school in Moscow. He must have had excellent language teachers, for several of his articles on what came to be known as Korsakoff syndrome were written in flawless German and English. After completing his medical studies, Korsakoff spent his entire career in neurological and psychiatric clinics. It was as a hospital physician that he was awarded a doctorate in 1887, for his dissertation on 'alcohol paralysis' and the other physical and mental effects of alcoholism. When a psychiatric clinic was opened at the University of Moscow the following year, Korsakoff, by then professor of neurology, accepted an invitation to take over as director.

There is an odd tension between his psychiatric and his neurological work. In Russia, his reputation is based not only on the syndrome that bears his name, but also on his pioneering attempts to humanize the care of psychiatric patients. He advocated a form of nursing which did not include bars on the windows, straitjackets, or any other physical restraints. He was not a proponent of sleep therapy or rest cures. Patients were better off living in small communities in the country, under the supervision of psychiatrists. Sedatives should be used to calm patients, not to keep them in a permanent soporific state. Such views met with resistance among doctors and nurses: the lack of physical restraints meant that greater demands were placed upon those caring for patients.

At the same time, Korsakoff believed that all forms of mental illness can ultimately be traced to a disorder of the nervous system, and that patients can only be cured by following a neurological trajectory. The specific memory disorder which he had observed in many of his patients, not only alcoholics, but also people who had never touched a drop, was in his eyes yet another confirmation of the theory that psychological disorders can always be traced to damage to the nerves.

The first publication devoted to this disorder appeared in a Russian journal in 1887, under the title ‘On a polyneuritic psychosis with a singular disturbance of concentration and pseudo-reminiscences’. According to Korsakoff, polyneuritis caused both acute confusion and pseudo-reminiscences, due to the patient’s tendency to mistake his fabrications for actual memories. This initial description of the condition was followed in 1889 by an extensive article in the *Revue philosophique*.² In 1890 and 1891, three more articles appeared in German psychiatric journals.³ These platforms were all well chosen, for at the time it was not English, but rather French and German which predominated in the fields of psychiatry and neurology. Moreover, the *Revue philosophique* was edited by the neurologist, Théodule Ribot, which meant that Korsakoff was almost assured of a favourable assessment. In 1881, Ribot had published his monumental monograph on memory disorders, *Les maladies de la mémoire*.⁴ No doubt Korsakoff felt he could count on a warm welcome for an article which he entitled ‘Étude médico-psychologique sur une forme des maladies de la mémoire’. And, more importantly, one which contained a clinical confirmation of Ribot’s own conclusions. The article opened with a case history.

² S. Korsakoff, ‘Étude médico-psychologique sur une forme des maladies de la mémoire’, *Revue philosophique*, 28 (1889), 501–30.

³ S. Korsakoff, ‘Über eine besondere Form psychischer Störung, combinirt mit multipler Neuritis’, *Archiv für Psychiatrie und Nervenkrankheiten*, 21 (1890), 669–704; S. Korsakoff, ‘Eine psychische Störung, combinirt mit multipler Neuritis (Psychosis polyneuritica seu Cerebropathia psychica toxæmica)’, *Allgemeine Zeitschrift für Psychiatrie und psychisch-gerichtliche Medicin*, 46 (1890), 475–85; S. Korsakoff, ‘Erinnerungstäuschungen (Pseudoreminiscenzen) bei polyneuritischer Psychose’, *Allgemeine Zeitschrift für Psychiatrie*, 47 (1891), 390–410. An English translation of the second German article dating from 1890 appeared in 1955 in M. Victor and P. I. Yakovlev, ‘S. S. Korsakoff’s psychic disorder in conjunction with peripheral neuritis: a translation of Korsakoff’s original article with brief comments on the author and his contribution to clinical medicine’, *Neurology*, 5 (1955), 394–406.

⁴ Th. Ribot, *Les maladies de la mémoire* (Paris, 1881).



С. Корсаков

Figure 6.1: Sergei Sergeivich Korsakoff (1854–1900)

Really nothing wrong

On his travels to Siberia, a 37-year-old Russian writer had got into the habit of drinking large quantities of brandy. Alcohol abuse, Korsakoff hastened to add, was one of the major causes of polyneuritis. Friends noticed that his memory was deteriorating, and that each morning he had to be reminded of his plans for the day. They also saw that his gait was becoming unsteady. On 25 June 1884, the man drastically curtailed his intake of alcohol. He gave no reason for this decision, and his friends speculated that his memory was now so poor that he even forgot to drink. That night he slept badly: he was agitated, repeated his questions over and over, and did not want to be left alone. In the days that followed, his agitation increased and it was clear to those around him that he could no longer remember anything. He barely slept.

Korsakoff saw the patient on 30 June. The first thing he noted was that the patient had absolutely no recollection of things which had just happened. He did not know if he had eaten or not, or whether he had had any visitors that day. Everything that happened more than five minutes before was immediately erased. When reminded of

something that had just taken place, he remarked that he had always had a poor memory. However, memories of events before his illness were still intact. For example, he recalled that in June he had started a short story. He had got over half-way, but could no longer remember how he had planned to end the story.

Later, when the crisis had subsided, the writer became adept at pretending that there was really nothing wrong. His reasoning was perfectly logical, and he conversed with friends on a wide range of subjects, relying on the 'intellectual capital which he had acquired over the years'.⁵ In actual fact, Korsakoff wrote, the circle of his thoughts had become quite narrow. If he was interrupted, he immediately lost his train of thought, and often repeated what he had just said, with the identical phrasing and the identical intonation. It struck Korsakoff how stereotypical his sentences were: a particular impression always evoked the exact same cliché, presented in a tone which suggested that it had just occurred to him.

And Korsakoff saw something else. Despite his memory loss, the man appeared to have stored traces of his experiences, 'no doubt in the unconscious sphere of psychic life'.⁶ The patient had never met Korsakoff before he fell ill, and claimed at each visit that he did not know him, neither his name nor his face, but from the beginning he was aware that he was talking to a doctor. Equally striking was the fact that the patient could give a detailed description of events which had never taken place. He described exactly where he was the day before, and if someone pointed out to him that those details were a figment of his imagination, he refused to believe them. It was not long afterwards that paralysis of the limbs and the respiratory muscles set in, ultimately leading to the death of the patient.

Korsakoff had recorded the same pattern of symptoms in a number of other patients. It was invariably the 'old' memories that were preserved. This sometimes gave rise to bizarre situations: one patient

⁵ Korsakoff, 'Étude', 503. ⁶ *Ibid.*

was very good at checkers, but only minutes after the board was removed, he denied that he had just played checkers, and even claimed that it had been ages since his last game. Another patient, a former anatomist, was capable of describing, in almost pedantic detail, the exact structure of the vascular system in a particular part of the body, and yet had no recollection of an event which had taken place 15 minutes before. These patients also had a poor memory when it came to their own mental processes: they forgot what they had just said, and embarked on the same rambling story for the tenth time in the space of an hour. One of them would sit for hours with the same page of the newspaper in front of him, and every few minutes he was struck by the same amusing item, which he promptly read aloud: ‘Écoute donc, maman.’⁷ ‘During a session of electrotherapy lasting less than ten minutes’, Korsakoff wrote, ‘another patient told me at least five times that at secondary school he was afraid of electricity and always fled from the physics laboratory. Each time this information was repeated, in the same stereotypical wording, it was as if he was telling me something new. I knew beforehand that as soon as I placed the electrode on his skin, he would say, “Oh, electricity! I’ve always been frightened of electricity”, etc., etc.’⁸

Another characteristic symptom, especially in the early stages of the disease, is the habit of confabulating: patients would fill in the gaps in their memory with made-up stories. Although bedridden for months, they cheerfully recounted where their walk had taken them the day before. Due to the disorientation in time and the absence of any recent memories, patients had no idea how long they had been in the institution, and often underestimated their own age. Because they took their reminiscences for recent memories, they lived in the past, referring to the people around them by the names of old friends or family members long since deceased.

⁷ *Ibid.* 509. ⁸ *Ibid.*

Korsakoff's patients themselves were largely unconcerned. They dismissed their memory problems, did not consider themselves ill, and did not grieve over the loss of so many memories. Most of them viewed their problems with indifference, although there were those who were afraid they might have said something unpleasant or improper.

Once the fearful agitation of the early stages had passed, the patient gradually regained the ability to think calmly and logically. But there was little or no restoration of memory. Initially, some patients would read the same passage again and again without realizing they had read it before. 'Recovery' usually meant that they finally recognized the passage, but were unable to recall the contents. One of Korsakoff's patients, a lawyer, recovered sufficiently to work as a corrector for a newspaper. He had no trouble locating the errors, but had to mark carefully each line in pencil, since otherwise he would have read the same line over and over. He later returned to the law, where he managed to cope by relying on commonplaces and past routine.

Korsakoff's explanation for the peculiar selectivity of this memory disorder – the disappearance of recent experiences and the survival of 'old' memories – was in keeping with the description given by Ribot in *Les maladies de la mémoire*. When cells are activated by a stimulus, they undergo a change which ensures that the following activation of those cells is not only faster, but also evokes the original experience. Memories are connected by 'association paths', and the more paths there are leading to a particular memory, the greater the likelihood that that memory will be reproduced. According to Korsakoff, the poisoning of the nerves weakens the fixation powers of nerve cells, but in his view the root of the problem lay in the damage to the association paths. In many cases, the memories have been recorded, but the ability to access them has been lost: they are still present as fragile, latent traces which are capable of influencing behaviour without entering the consciousness of the patient. 'Old' memories escape this fate, because they were recorded via numerous associations, have

been repeated more often, and are more automatic, making them easier to recall. But these memories, too, are difficult for the patient to interpret, because his powers of association are impaired. He is unable to give them a place within his present experience, he doesn't know which period or situation they pertain to, whether the event or situation is something which he experienced, or dreamt, or made up. They become ghostly snatches of events which float in and out of his consciousness. In one of his Russian articles, Korsakoff referred to a woman who was fond of describing a trip to Finland she had taken before she became ill, but intertwined with this description were her recollections of a journey to the Crimea. As a result, she described a Finland populated by Tatars, whose diet consisted mainly of lamb.

Following his article in the *Revue philosophique*, Korsakoff published several German-language pieces on the medical aspects of the psychological disorder which he had identified. The fact that they were all submitted to psychiatric journals was no coincidence, as the condition was scarcely known among psychiatrists. General practitioners and gynaecologists, by contrast, were familiar with it, as it often occurred as a complication of other maladies, such as poisoning or childbed fever. This also explains why the disorder had not been described in detail: physicians focused on the primary illness and failed to notice the secondary one. The psychological symptoms present together with the physical complaints arising from polyneuritis: paralysis, cramps, oedema, atrophy of muscle tissue, unstable gait, double vision and reflex paresis. The disease begins with a crisis:

The patient cannot rid himself of obsessive, anxious thoughts; he expects something terrible to happen – either death, or some kind of seizure, or a catastrophe he cannot give a name to. He is afraid to be alone, constantly entreats people not to leave him, while groaning and lamenting his fate. At times there are wild shouts, near-hysterical episodes during which the patient is capricious, upbraids the people around him, throws things at members of the household, and beats

his chest. The agitation is particularly severe at night; patients are usually sleepless and disturb the sleep of others; they constantly call for help, demanding that someone stay with them, help them to change position, entertain them, and so on.⁹

Korsakoff wrote that other physicians had occasionally drawn attention to this memory disorder, the first of whom was Magnus Huss.¹⁰ This Swedish physician had introduced the term 'alcoholism' back in 1849, and described the memory disorder as one of the complications of that condition. What Korsakoff first brought to the attention of physicians was the fact that the disturbance also occurs as a side-effect of or together with polyneuritis, which is *not* due to alcoholism. He himself had already described fourteen cases in which the nerve damage was caused by other diseases, such as typhus, tuberculosis and childbed fever, and various forms of poisoning, including arsenic, lead, tainted grain and carbon monoxide. Even a foetus in a state of decomposition had caused a young woman to suffer from this type of memory loss. Korsakoff suspected that in all these cases the poisoned blood had given rise to neuritis, often in the brain. He gave this psychological disturbance a name which neatly sums up the causal course of the condition: *cerebropathia psychica toxæmica*: brain disease as a result of blood poisoning. In his own Moscow clinic, a female patient suffering from this disease had just died, and the autopsy revealed that almost all the nerves were inflamed.

All the strings that have ever vibrated

A nervous system ravaged by inflammations was still able to retain memories from the past. What it could not do was to store new experiences. Korsakoff's patients found themselves on the edge of

⁹ Quoted from the translation by Victor and Yakovlev, 'Korsakoff's psychic disorder', 397.

¹⁰ Korsakoff, 'Psychische Störung', 483.

an empty plain, where each subsequent footprint would immediately be erased. And those memories that did surface from the patients' past were no longer reliable. The things they thought they remembered, which *seemed* to be memories, were often fabrications. Apparently, these patients had lost the ability to identify the source of their thoughts and ideas. Things they had once dreamt, read, heard or imagined returned to their consciousness in the guise of personal memories. These 'pseudo-reminiscences', as Korsakoff dubbed them, varied from patient to patient, but were almost always of an ominous or morbid nature. Korsakoff noticed that they often had to do with death. Patients said that someone had just passed away or that they had recently attended a funeral; they mentioned the name of the deceased and the church where the services had taken place. Pseudo-memories of this type were often recounted by patients who had been, or still were, close to death. Such memories could develop into a delusion, causing intense agitation. In the autumn of 1889, Korsakoff was called in for a consultation on just such a case.

P was a 53-year-old businessman.¹¹ He had a strong constitution, was a moderate drinker, and his health was good up until 21 August 1889, when he caught typhus. For three weeks he ran a high fever. When on 15 September the fever finally subsided, he was disoriented, his speech was incoherent, and his memory, which had previously been good, was seriously affected. He almost immediately forgot whatever was said to him. Until late September he lay in bed, subdued and silent. After he had recovered some of his strength, the family noticed that his memory began to improve, but also that he began to relate things that could only have sprung from his imagination. P told them that someone had died, that somewhere there was the body of a man, and that it had to be buried. He returned to the subject again and again. As long as he was too weak to even leave his bed, the family listened to him and tried to put his mind at rest. But as he began to

¹¹ Korsakoff, 'Erinnerungstäuschungen', 395–9.

recover, the stories became increasingly agitated and insistent. There was a young man who had once done him a favour and now he was dead and he felt obliged to see that he was given a decent burial. Initially, he thought the deceased was somewhere in the house. Later the story changed, and P said that he was sure the body was in Medynzeff's house on Pokrovski Boulevard, and that arrangements had to be made for the funeral. The family was faced with a dilemma. P's memory had largely recovered, he was lucid, and his condition was much improved. However, that one isolated delusion remained, and there was no way they could talk him out of it. At their wits' end, they decided that the only solution was to go to the house in question, so that he could see for himself that there was no body there. When they arrived, P called the concierge over to the carriage and inquired about the deceased. Korsakoff: 'Naturally, the concierge was quite surprised and said that no one in the house had died. The patient returned home, and for a long time remained sunk in thought. He then proceeded to adjust his delusion. He now claimed that the dead man had already been buried and it was his duty to take care of the cost of the grave and the funeral expenses. This thought likewise took possession of him, and every day, especially towards evening, he began to insist that his family go with him to pay the amount that was due.'¹²

All this took place around the middle of October. On 21 October, Korsakoff had an opportunity to examine the patient himself. His first impression was that P had made a complete recovery. He knew where he was and that a physician had come to see him. He knew which doctor had treated him, and also that he had been seriously ill. It was only after the interview had gone on for some time that it became clear that his memory was still quite deficient. During the conversation he repeated himself on several occasions, and had no idea what he had done earlier that day. Korsakoff, too, was treated to an account of the unpaid bill. P had rented the house himself, there was some

¹² *Ibid.* 396–7.

relationship between the young man and his children, and he felt obliged to pay the funeral expenses, which came to such and such an amount. All these details were recounted calmly and quietly. The situation at home, however, was quite different, as Korsakoff heard from the family. When the man started going on about the bill, he became so agitated that it was difficult to calm him down. They also told Korsakoff that P's delusion might be related to an event that had taken place some eight years before. The patient's children had contracted some deadly disease and had to be nursed in a special house, which P had rented himself and which was not far from Medynzeff's house. The children survived the disease, and returned home.

Shortly after Korsakoff's visit, the situation became intolerable. P had recovered to such an extent that he could not be deterred from carrying out his plan. The family then devised a ruse: the concierge at the Medynzeff house agreed to tell P that the person he was looking for had moved away. He would then give him the address of the physician who was treating him. There, too, the residents were aware of the ruse. When P left Medynzeff's house and arrived at the physician's door, he was told that the man he was looking for was not at home, but had left instructions for him to accept the money. P paid him and returned home quite satisfied. After a few days, however, he became restless again. He insisted on going back to Medynzeff's house just one more time: he had left some of the young man's belongings there and had to see to them. After several visits, he was informed that Medynzeff had gone abroad and would not be returning in the foreseeable future. It was only then, in January 1890, that the delusion was laid to rest. Apparently P had concluded that his story contained a number of inconsistencies, and he did not return to the subject. In fact, he would not allow anyone else to discuss the matter either. The only reminder of his delusion was a burning desire to travel abroad. The destination which he had in mind was the city where Medynzeff was supposedly living.

Korsakoff believed that P's delusion was an indication that memory traces never entirely disappear. In the depths of one's memory, beyond consciousness, they form associative links with other traces. In P's case, the mortal danger in which he found himself may have become bound up with memories of the life-threatening illness from which his children had suffered. This strange construct of erroneous associations, together with one or two realistic fragments, then took shape in his consciousness, at a time when it was too weak to correct the misrepresentation of the facts. Here was proof that the vibrations of neurological traces never totally die out. In this light, Korsakoff concluded, no matter how serious the memory loss, in every patient there is something that is characteristic of him, something in which, despite all the damage, he remains himself: 'In his soul, there is the quiver of all the strings that have ever vibrated, a gentle echo of every thought he ever had. They are not all equally strong, and – keeping to the metaphor – unlike sounds may emerge, or different melodies, but the timbre of the melodies remains the same.'¹³

Thiamine

In 1897, Korsakoff organized the Twelfth International Medical Congress in Moscow. In the section Neuropsychiatry, he was the recipient of fraternal praise from Friedrich Jolly, professor and director of the Berlin mental hospital the Charité.¹⁴ Jolly observed that the mental disorders accompanying polyneuritis had on occasion been described, but nowhere as systematically and graphically as by Korsakoff. After Korsakoff, any institutional physician was capable of recognizing a syndrome which previously had barely been noticed. Apparently, this also held true for Jolly himself. In December 1891,

¹³ *Ibid.* 405–6.

¹⁴ F. Jolly, 'Über die psychischen Störungen bei Polyneuritis', *Charité Annalen*, 22 (1897), 579–612.

shortly after the appearance of Korsakoff's German articles, he began keeping a record of all the patients admitted to his institution with a diagnosis of polyneuritis. Between then and September 1897, he recorded a total of sixty such patients. Many of them had a history of alcoholism, but there were also four cases of acute arsenic poisoning following a suicide attempt. Some twenty-two patients were found to be suffering from a delirium. After the disappearance of the delirium, they reported no memory problems. In nineteen patients there were signs of the memory disorder described by Korsakoff. But there were also nineteen patients *without* any memory problems. This was hardly a clear picture: polyneuritis could present with or without a memory disorder, and in exactly the same number of patients. Moreover, Jolly had two patients without neuritis who did have the memory disorder. Apparently, all combinations were possible, so that at this point it was difficult to draw any conclusions about the cause of the neuritis or the memory disorder, or the relationship between them. In such cases, Jolly maintained, it is better to formulate the description in as neutral a manner as possible: 'If the proposal is accepted to refer to this state as the Korsakoff complex of symptoms or – even shorter – the syndrome of Korsakoff, then we now have a simple term for a characteristic syndrome, a term which is not bound up with an attempt at a hypothetical explanation, thereby simplifying the subsequent discussion.'¹⁵ Thus, the name of the condition was not to be *cerebropathia psychica toxæmica*, but rather the Korsakoff syndrome. After Jolly, Korsakoff syndrome became increasingly detached from the neuritis and is now generally confined to the memory disorder.

As regards the probable cause, Jolly and Korsakoff were in agreement. The memory disorder was not a direct consequence of alcohol, arsenic, lead, or any other poisonous substance. It seemed more likely that poisonous substances had brought about some metabolic change, producing a secondary, as yet unidentified, substance which

¹⁵ Jolly, 'Psychischen Störungen', 595.

was responsible for the self-poisoning. Jolly could simply not conceive of any other explanation. And no doubt this was quite literally the case, for physicians who trained in the 1870s were totally unfamiliar with the concept of a deficiency disease. There was only one exception, and that was scurvy, which could be cured by means of sauerkraut or fruit. Given the symptoms which Korsakoff had identified, it was more logical to think in terms of an infection or a poisoning rather than a deficit.

That same inability to think in terms of a deficiency played a role in the investigation of a disease which in certain respects tallied with the symptoms recorded by Korsakoff and which, moreover, had an interesting connection with the Dutch Indies.¹⁶ With the advent of steam-powered mills in the 1870s, it became possible to remove the so-called silver skin surrounding each rice kernel. In the course of time, the native population, who were dependent on rice, developed a disease which they referred to as beriberi. In 1879, the Dutch physician Van Leent noticed that Indonesian sailors suffered from beriberi, while the Dutch members of the crew were spared.¹⁷ He concluded that rice contained a poisonous substance which became concentrated in the body and ultimately gave rise to the disease. No such substance has ever been found. But in the 1890s, the bacteriologist Christiaan Eijkman discovered that the silver skin which was removed during polishing contained a substance which *prevented* the occurrence of neuritis. By feeding chickens polished rice, he succeeded in generating polyneuritis experimentally, and then curing it by feeding them unpolished rice. In 1911, the physiologist Funk isolated a substance which cured polyneuritis in birds: by combining the words 'vita' and 'amine', he characterized this substance as essential for life. In 1936, thiamine, one of the vitamins of the B group, was synthesized. In clinical studies, Korsakoff patients responded well to high doses of

¹⁶ B. A. Blansjaar, *Alcoholic Korsakoff's Syndrome* (Leiden, diss., 1992), p. 1.

¹⁷ F. J. van Leent, 'Über Beri Beri', *Allgemeine Wiener Medizinische Zeitung*, 24 (1879), 446.

thiamine. It appeared that Vitamin B₁ was for Korsakoff's disease what vitamin C was for scurvy, although thiamine supplementation could not entirely cure the memory disorder.

The critical role of thiamine was also borne out by research involving patients who were not getting sufficient vitamin B₁ as a result of conditions other than alcoholism or disease. In 1947, a study was published focusing on the symptoms of prisoners of war in southeast Asia, who had contracted beriberi as a result of malnutrition.¹⁸ They were admitted to a Singapore hospital, where it was determined that they had begun to suffer from serious memory problems some six to fourteen weeks after being taken captive.

Today, Korsakoff-like symptoms have been described in connection with a whole series of conditions associated with a thiamine deficiency, including excessive vomiting during pregnancy, diseases of the digestive tract, and anorexia. Korsakoff syndrome may also present as a complication of a hunger strike or even a stomach reduction. The human body is incapable of storing vitamin B₁. When it does not enter the body or cannot be absorbed, memory problems can occur within a matter of months. The Russian author, the woman who thought Finland was full of Tatars, the Moscow businessman searching desperately for the body of his friend, and all Korsakoff's other patients, whether alcoholics or not, were simply suffering from a lack of vitamin B₁.

During the 1980s in Australia, various initiatives focusing on prevention were considered.¹⁹ The fact that the typical Korsakoff patient was a beer drinker led physicians to consider the practical solution of adding thiamine to beer. However, they never succeeded in raising the necessary support for this move. Dieticians were against the suggestion on principle: it was simply wrong to add something good

¹⁸ H. E. de Wardener and B. Lennox, 'Cerebral beriberi (Wernicke's encephalopathy): review of 52 cases in a Singapore PoW hospital', *The Lancet*, 1 (1947), 11–17.

¹⁹ A. S. Truswell, 'Australian experience with the Wernicke-Korsakoff Syndrome', *Addiction*, 95 (2000) 6, 829–32.

to a substance you want people to consume less of. Beer brewers were afraid it would alter the flavour and pointed out that because of their poor memory, Korsakoff patients were not the most reliable informants with respect to their alcohol consumption. It was decided to add thiamine to bread, a step which had already been taken in most developed countries. This was not done specifically for the benefit of Korsakoff patients: it was found that the processing of wholemeal flour to white flour was accompanied by a vitamin loss that had to be compensated for. The result was a drastic reduction in the number of new Korsakoff cases. It is unlikely that we can rid the world of Korsakoff's disease by means of bread alone. As long as brewers see no future in beer containing thiamine, an Australian physician reflected, there can be no focused prevention.

Wernicke-Korsakoff

In the medical literature dating from before Korsakoff, there are easily ten or twelve different descriptions of patients who would today be diagnosed as Korsakoff patients. None of those authors have ever been honoured with an eponym. There is no syndrome of Hooke (1680), or D'Assigny (1697), or Lawson (1878).²⁰ Priority is an over-rated factor when it comes to discoveries. Of these three, the most promising candidate is Robert Lawson, a physician at the Lunatic Hospital in Exeter.²¹ He published an article in the newly founded journal *Brain* which focused on three separate types of mental disorders traceable to chronic alcohol abuse. One of these is a form of 'dementia' accompanied by an 'almost absolute loss of memory for recent events'.²² Even on the doctor's third visit of the day, the

²⁰ These candidates are mentioned in a survey article by M. D. Kopelman, 'The Korsakoff syndrome', *British Journal of Psychiatry*, 166 (1995), 154–73. German or French authors nominate others in turn.

²¹ R. Lawson, 'On the symptomatology of alcoholic disorders', *Brain*, 1 (1878), 182–94.

²² Lawson, 'Symptomatology', 183.

patient will deny ever having laid eyes on him before. Lawson sought the explanation in a malnutrition of the brain: the starved and shrivelled brain cells were no longer able to retain impressions. He had obtained good results with meat extract.²³ Lawson's article appeared in 1878, over ten years before Korsakoff's first publications on the subject. But if we compare the two, it is immediately clear that Korsakoff not only had a better hand, he also played it more skilfully. The condition which Lawson documented was described as one of several mental disorders which may arise from the excessive use of alcohol, while Korsakoff focused on that single disorder. Lawson's notes covered a scant two pages, and he provided only a few examples of typical memory loss. Korsakoff, on the other hand, presented elaborate case histories featuring patients who come alive for the reader, like characters in a novel. In examining the memory loss of each patient, he noted details such as what was spared 'in the unconscious sphere', aspects which Lawson did not notice or at least did not mention. Lawson's views on the subject were confined to that one article in a neurological journal, whereas Korsakoff embarked on a veritable campaign, in Russian, French and German. He targeted not only neurological and psychiatric journals, but also the widely read *Revue philosophique*. Unlike Lawson, Korsakoff interwove his hypotheses on cause and course with the existing theories on memory traces, such as those of Ribot. In other words, Korsakoff positioned his observations within a much broader geographical and disciplinary network, and kept the memory of his contribution alive by means of the association paths within that network.

The same could be said of the German neurologist Carl Wernicke. In 1881 (again well before Korsakoff) he described a disease which often accompanied chronic alcoholism and was characterized by three symptoms: acute confusion, visual problems (including double

²³ Meat does indeed contain relatively high amounts of vitamin B1.

vision and eye tremors), and an uncertain gait.²⁴ Known as the triad of Wernicke, these symptoms pointed in the direction of a disease he called 'encephalopathy' (which later came to be known as 'Wernicke's disease'). Some of the symptoms corresponded to those which Korsakoff had seen in his own patients, but in his publications he had not made the connection with the work of Wernicke. That would not happen until half a century later. In the acute phase of the illness, many Korsakoff patients have visual problems and experience difficulty walking, while Wernicke patients respond better to thiamine supplements than Korsakoff patients. In the 1980s, the theory that Wernicke's disease marks the crisis-like onset of what will ultimately develop into Korsakoff's syndrome, and that the two syndromes actually represent different stages of the same disease, led to the contraction 'Wernicke-Korsakoff syndrome'. This theory has since lost much of its appeal, and the current view is that the two syndromes can develop independently of one other. A patient may suffer from Korsakoff syndrome without having gone through the Wernicke stage, while the triad of Wernicke is not always an ominous portent of Korsakoff's. However, there does appear to be a genetically determined vulnerability to both diseases. There are a great many more chronic drinkers than there are Korsakoff or Wernicke patients and, according to the latest insights, this is due to the fact that in certain patients a thiamine shortage is quicker to result in damage to certain enzymes.²⁵

Unconscious sphere of psychological life

Scattered throughout Korsakoff's case studies are numerous examples of a phenomenon which he appears to have found intriguing: no

²⁴ C. Wernicke, *Lehrbuch der Gehirnkrankheiten für Ärzte und Studierende* (Kassel, 1881).

²⁵ L. C. Heap *et al.*, 'Individual susceptibility to Wernicke-Korsakoff syndrome and alcoholism-induced cognitive deficit: impaired thiamine utilization found in alcoholics and alcohol abusers', *Psychiatric Genetics*, 12 (2002), 217–24.

matter how deep the memory loss was, the patient was often capable of registering an experience. The traces of that experience ended up in a layer of memory which was not accessible to his consciousness, but was nevertheless capable of influencing his mood, his associations and his reactions. For some time Korsakoff had been treating one of his patients with a 'Dr Spamer electric shock machine', by which a galvanic shock could be administered. When he entered the room, he asked the patient if he knew why he had come. The man said that he had no idea. Korsakoff asked him to look at the table, where he had deposited the closed box containing the device. With an uncomfortable glance at the box, the man ventured a guess that he had probably come to treat him by means of electricity. Korsakoff was certain that the man had never seen such a device prior to his illness. Apparently, there was such a thing as an 'unconscious sphere of psychological life'.

Korsakoff drew this conclusion on the basis of his observations during daily contacts with patients: the first time he came in they held up a hand in greeting. If he came in again five minutes later, they said that they hadn't seen anyone for hours, but no greeting was forthcoming. In 1907, the Geneva psychiatrist Édouard Claparède attempted to demonstrate empirically that what he called the 'unconscious memory' was still partially intact in Korsakoff patients.²⁶ But how can you test memory when the whole problem is that the reproduction function is defective? Claparède opted for the 'saving method', a technique introduced by Ebbinghaus in 1885. Instead of asking the patient to reproduce something directly from memory, he set out to establish how much less effort was required to learn something for the second, third or fourth time. Claparède's subject was a 47-year-old Korsakoff patient who was hospitalized in 1900. She displayed the

²⁶ É. Claparède, 'Expériences sur la mémoire dans un cas de psychose de Korsakoff', *Revue Médicale de la Suisse Romande*, 27 (1907), 301–3. Claparède's article was published in an English translation: S. Nicolas, 'Experiments on implicit memory in a Korsakoff patient by Claparède (1907)', *Cognitive Neuropsychology*, 13 (1996) 8, 1193–9.

classic symptoms: her previous knowledge was still present, she knew all the capitals of Europe by heart, but could not say what she had done that day or what year it was. One day, Claparède showed her a card containing ten arbitrary words, and asked her to read them. After reading them once, she was able to reproduce two words. Having read the list again, she could remember four. After going over the list five times, she could reproduce seven of them. When Claparède repeated the test the following day, she could remember seven words after reading the list twice, and a day later after only one reading. One month, two months, and ten months later, she was capable of reproducing seven words after one reading. All this time, the woman did not recognize Claparède, and could not remember ever taking part in a test involving words. And yet she had less and less difficulty 'learning' from the list. Equally striking was the fact that, while she was unable to repeat something that had been said to her, when Claparède forced her to make a guess, she often guessed right. One day, he had told her a story about a 64-year-old woman who was bitten by a snake while herding her sheep. The following day, when he asked her about the story, she couldn't remember anything about it. Claparède insisted, telling her that it was about a woman, and asking if she remembered how old the woman was. 'Wasn't she 64?', the patient said, quickly adding that she could just as well have said something else. For Claparède these results provided support for the dissociation theory formulated by Pierre Janet, a philosopher studying unconscious processes, who in his day was just as influential in the French-speaking world as Freud. While the patient was not capable of assimilating her memories in her consciousness, they did have some influence on her thinking and the way she experienced things.

These days, Korsakoff patients are popular subjects for experiments which focus on what since the 1980s has been known as 'implicit memory', the type of memory which is spared even in serious cases of memory loss, despite the fact that it is not directly accessible. What in Claparède's case was a passing observation became an experimental

technique in the research focusing on implicit memory: forced guessing. The subjects are not capable of actively reproducing anything, but they do guess right more often than can be explained by pure chance. Nursing staff can make use of this secret power of learning. By housing subjects in fairly small communal units, it is possible to slowly introduce routines which promote the ability to manage on one's own. There are even some non-recurring experiences for which the anterograde amnesia which defines Korsakoff syndrome is not absolute. There are indications that events which give rise to strong emotions in patients, and which for that reason may activate other parts of the brain than emotionally neutral memories, are nevertheless stored. Researchers have established that seven months after the event, two out of three Korsakoff patients knew what had happened on 11 September 2001.²⁷

If Sergei Korsakoff had reached the age of retirement, he would have experienced the isolation of vitamins and the recovery from polyneuritis in animals. But that was not to be. In the midst of a successful career, surging full-steam ahead as a physician, author and researcher, but with an insidious heart condition, Korsakoff died in 1900 at the age of 46.

²⁷ I. Candel, M. Jelicic, H. Merckelbach and A. Wester, 'Korsakoff patients' memories of September 11, 2001', *Journal of Nervous and Mental Disease*, 191 (2003) 4, 262–5.