neuritis. Various authors have reported in alcoholic neuritis the Argyll Robertson pupil, but nowhere do I find hypoglossal palsy referred to.

The twelfth nerve, as we are all aware, is purely motor in function, supplying both the extrinsic and intrinsic muscles of the tongue. The nucleus of origin of the axones of this nerve lies in the dorsal portion of the oblongata toward the lower portion of the fourth ventricle. Why then should this nerve not be more frequently involved in such an area where many other nerves become paralyzed? We are aware that it is a common affection in diseases involving the bulb, such as bulbar palsy, acute and chronic, also in the unilateral form in cerebral hemiplegia—but in such cases if the patient survives we find an atrophy of the tongue as a result, whereas in the case under discussion no such phenomenon occurred. Aneurysm of the vertebral artery and syphilitic processes, have been known to involve the nerve, as has an isolated neuritis in rare cases, but atrophy seems to have been a constant accompaniment of all such cases. Moreover, nearly all such palsies have been found to exist chiefly on one side, whereas in this case both nerves were involved from the fact that the tongue remained helpless and immovable in the floor of the mouth, and it was impossible for the patient to speak except in a most imperfect way. Mastication was impossible and deglutition was likewise interfered with for several days.

The fact then having been established that we had a complete paralysis of the hypoglossal nerve on both sides associated with a typical case of multiple neuritis, our next considerations are: what was the cause of this unusual occurrence, and why does it not occur more frequently? In answer to the first question, I suggest that the condition must have been produced by a poison in which infective microorganisms were evidently most virulent—in the presence of a derangement of normal metabolism. To the last question, viz.: why does it not occur more frequently? I am at a loss for a reply. I am compelled to leave this to be answered by others. If such can be done, the purpose of this article has been accomplished—for since I have had the case under my care no one has attempted to account for this fact, although it has been discussed with many of our most eminent neurologists and anatomists of this section as well as those on the Atlantic coast.

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KORSAKOFF'S PSYCHOSIS AND THE AMNESIC SYMPTOM- COMPLEX

WITH A REPORT OF THREE CASES *

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Memory, as one of the mental faculties, varies with the endowment and degree of development in each individual human being. It reaches an acme of keenness at an age reputed to be about 40, after which it is said to be at a standstill, though some contend that it is even then undergoing a slow retrogression, recognizable in traces only for some decades, varying in different individuals and by no means always deserving Oslerism at the age of 60. Virchow's saying that one is as old as his arteries is perhaps the real criterion governing the

state of one's memory as well as the state of youthfulness in general. The lapse of time is certainly not the deciding influence in all cases, as one meets with declining memory at the age of 50, and youthful memory at the age of 80. However, the majority of those arriving at the grand climacteric of man begin to face difficulties in remembering proper names and to confound technical terms. Still, of course, these difficulties seldom amount to a real senium præcox or early aging. This retrogression of memory, which might perhaps be called physiologic, first shows itself as an occasional loss of a word, but afterward becomes more general and it is then the events most recently experienced which the individual is unable to preserve, while he continues to be able to reproduce memory pictures from the past with great accuracy.

Finally, as senility becomes advanced, he frequently confounds places and persons, and fables about events which have never taken place; at last he will be observed to fill out the lacunæ in his memory with phantoms of his imagination, which in character reflect his helpless childishness. The enfeebled state of his memory is also evidenced by an increasing tendency to tell the same thing over and over again. At the same time, he shows confusion, roams about aimlessly, not recognizing his home or surroundings. In such extreme cases of senile decline we find manifestations which remind one of the elements which go to make up the so-called Korsakoff symptom-complex.

It is, of course, only very exceptionally that the recording faculty shows such defects that the impression is forgotten almost the next moment, that the individual feels more or less estranged at all times and confounds persons and places, and that he not only has a very poor memory, but also shows an inclination to fill up the many interstices in the same with fictitious dates, persons, places or events.

These defects, however, are at times so marked in the prematurely aged person that they constitute the four elementary factors of this symptom-complex, which are: (1) defective recording faculty; (2) enfeebled memory for events of the recent past; (3) disorientation; and (4) confabulation. The last-mentioned symptom bears a certain relationship to the mental vivacity, and where there is a high degree of amnesia, but with the retention of a coherent and attentive demeanor, the cases are more productive and the confabulations plainer. This is especially characteristic of the senile Korsakoff. When in cases of the senile or the alcoholic form the disorientation is well marked, one always finds pseudo-remiscences, usually made up on the spur of the moment, as if in a way to bridge the memory-defects, for which reason Bonhoeffer calls them embarrassment-confabulations.

The patients, says Kraepelin, do not infrequently pass good judgment on things not directly connected with their memory-lacunæ and when recognizing the correctness of objections made, often with ready wit attempt to cover up the inconsistency of their stories, which sometimes reveal a marked delusional tinge and show an admixture of persecutory and grandiose ideas. At the same time, the manner in which they tell their stories seems to evidence that the confabulations appear to them to carry the stamp of complete subjective certainty, and they relate them as if they did not entertain the least doubt but that they were faithfully portraying the reality.

Tiling first drew attention to the fact that the senile form is usually started by fainting-spells and apoplectic-form attacks, or the history shows an intercurrent period

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of agitation—a delirium of apprehension. Bonhoeffer, in fact, says that he has never seen the amnesic symptom-complex develop in the way of a slow increase of the senile memory-defects without intercurrent acute symptoms. The prognosis of the senile Korsakoff is more unfavorable than the toxic form. Still, even when the amnesic state has lasted a long time, improvements have been met, especially when in such cases there has been a certain craving for activity and the whole picture has had a delirious tinge. Besides the usually pronounced emotionalness of the senile form (Wernicke's presbyophrenia) and the somatic symptoms of the senium, may in differentiation be mentioned the sleeplessness frequently met with, the anxious states of senile character and the search and trash-collecting deliriums. The senile form is usually grouped with the arteriosclerotic as, to a certain extent, the same pathologic changes are characteristic of both.

The first one of the three examples of the Korsakoff symptom-complex, which I have observed at the Stockton State Hospital, is an illustration of this senile form. This case is pathogenically interesting in showing a very slow, uninterrupted course of development of defects of the recording faculty, extending over a period of fourteen to fifteen years until, at the end of this period, the amnesic symptom-complex is complete demonstrating the course of a simple, chronic form. It is true that the patient suffered a slight trauma five years after the memory defects began to show themselves and nine or ten years before admission to the hospital, but the trauma was very slight, without cerebral symptoms, and did not lead to the development of a somnolent state frequently mixed with traces of delirium, which, as has been pointed out by Kaberlah, usually characterizes the symptom-complex following commotio cerebri, nor can I assume that the development of the syndrome was started by the acute intercurrent of a toxemia due to cystitis of which there is no history. The case observed is as follows:

CASE 1.—Patient.—S. M. K., native of Maryland, 76 years old, widower, had two living children, no history of neuropathy; he had worked as mailing clerk in the postoffices of Sacramento and San Francisco, was known to be an expert in his knowledge of the location of small stations and towns, being often employed to unravel the mistakes of others. The work was confining, from 3:30 to 5 a. m., returning at 7 a. m., and working until 5 p. m., with an hour's interval at noon for luncheon. He was also on duty three evenings of the week. This was done steadily with only one or two vacations for forty years.

History.—For about five years before he retired from the service, he began to make errors until toward the last he made very grave ones, sending letters to the wrong places, even well-known cities, and was finally asked to resign. He had always led a very regular life, had been throughout his life a total abstainer from the use of liquor but had always been extremely nervous. (Lues and gonorrhea denied.) Shortly after he had resigned, i. e., about nine or ten years before his admission to the asylum, he went east with his son on a pleasure trip, and on the first day of the trip left the car for a short time. As he returned, the car started up suddenly and he missed his hold in trying to mount the rear platform, being thrown to the ground, striking presumably on his back. The train stopped and he was assisted aboard. A letter from the son describing the occurrence states that the patient "was well able to walk, had no pain anywhere and in every way conducted himself as usual." On the following day, however, he had difficulty in passing water, which developed into a retention of urine, requiring catheterization for about two months before the functions were restored. He at no time showed a rise in temperature and the bladder did not appear

to become affected. Soon after his return from the eastern trip, he gradually became restless, fidgety and peculiar—would buy large magnolia trees to send to eastern friends. As time went on, these peculiarities became worse; he would interview public men, proposing absurd ideas, such as removing the undertow from the river, etc.; would frequently get up in the middle of the night, dress himself fully and open the shutters, as was his custom in the morning. Although it was very dark, he did not appreciate the fact, not observing that he had to use artificial light. When asked why he got up he would say he had been called. He often accused his family of being tired of him and said that they wanted to put him away somewhere. His memory had been steadily deteriorating during the last fourteen years. He would forget names, spell incorrectly in his writing or leave out whole syllables. He would tell a story over and over again, forgetting that he had just recited it. He was somewhat subject to exalted ideas; thought money was left for him at various places; in his wanderings about the streets he would interview people concerning the wealth coming to him, not knowing to whom he was speaking and forgetting where he lived.

Examination.—When examined on his admission to the hospital, Aug. 21, 1903, he was found very good-natured—very anxious to go home. He was not cognizant of time and place; did not remember where he came from. He said that he had five children (he never had but two) and promptly gave their ages and names. He watched the exits every time the doors were opened, asking the same question: "May I go out with you? I want to go and see my family. I want to see my children—I have not seen them for fifty years." He entered into lively conversation with any strangers he happened to meet, took them to be people he knew, always promptly giving some fictitious name of the persons he was addressing and the name of the place at which he had met them, usually Sacramento postoffice, and promptly named their business and other details about them. He said he was not sick and never had been sick, and was confused as to immediate surroundings; could not find his room, place at the table, lavatory, etc. He insisted that the sun was rising in the west and was fearful that some calamity was going to happen because it had changed its course. He was not very steady on his feet, but no Romberg was present. His knee-jerks and other tendon-reflexes were somewhat increased; his pupils reacted to light, but only slightly, and there were no definite motor or sensory disturbances present, except paresthetic sensations; his hands and knees felt cold, no muscular atrophy. He was easily excited and teased by trifles, was unable to apply himself to any work and forgot what he was told to do a few minutes after the directions had been given. He presented no symptoms of digestive disturbances; his appetite was voracious. When a patient unintentionally rubbed against him or happened to shove him, he told his attendant about the terrible abuse he had suffered at the hands of nurses. When he met the same person, attendant or physician, several times in the course of an hour, he addressed him as if for the first time, but had always met the gentlemen in Sacramento or somewhere else and went into long details of description as to place and circumstances of the meeting.

Course of Disease.—These symptoms presented by the patient continued the same throughout the year of his stay at the hospital. In August, 1904, he had an attack of prostatitis with bladder trouble, the inflammation extending to the kidneys and he died from a cystopyelonephritis, Sept. 27, 1904.

In recent years it has been contended by some writers that it is incorrect to speak of a Korsakoff psychosis because the complete disease-picture, as described by Korsakoff, is not always met with; that some cases are unassociated with multiple neuritis and that the main features are found inserted into other pathologic states, as for instance the case just cited. Leading authors, however, like Bonhoeffer, Kraepelin, Tiling, etc., insist that, while the amnesic symptom-complex undoubtedly occurs as a part of varying pathologic states, those cases which develop on an alcoholic or toxic basis, and in the

characteristic manner lead to the manifestation of the four elementary constituents of the symptom-picture, should retain the name of Korsakoff's psychosis. As Bonhoeffer says, it is a disease which was symptomatologically first outlined by Korsakoff, a disease which has a demonstrable etiology and runs a definite course. Korsakoff described cases in 1887 as "cerebropathia toxemica psychica," a polyneuritic psychosis or disease *sui generis*, which is especially characterized by three fundamental manifestations: a toxic etiology, a polyneuritis and a peculiar mental picture. This original acceptance of the disease entity has since then been critically modified by Jolly, Tiling, Regis, Babinsky, Gudden and others, and it is now recognized that aside from being at times only a syndrome, the chief, most frequent and most distinct group of cases or, as many call it, the disease proper may or may not be accompanied by a multiple neuritis, and a general toxemia as well as an alcoholism may usher in the symptoms.

One finds occasionally in alcoholism of long standing cases of delirium terminating critically, which show few hallucinations and illusions while a loss of memory, defective recording faculty, disorientation and pseudo-reminiscences resembling in character the moment-confabulations are especially prominent. Some of these deliriums are protracted, others terminate in the amnesic symptom-complex, and Bonhoeffer insists that the majority of cases of Korsakoff's psychosis showing this alcoholic etiology may especially be differentiated by this delirium-tremens-like character of the delirious phase. The developmental phase is, however, not always delirious in character. In very heavy drinkers, a state of marked somnolence is met with in the early history of the case, and it is especially in such patients that neuritis combined with asymbolic and aphasic symptoms is never missed. This stuporous form is more common in women than in men and may begin with alcohol-epileptic attacks. Cases in this early stage have terminated fatally, forming a part of Wernicke's polioencephalitis hemorrhagica superior, in which the eye-muscle paralysis (ophthalmoplegia) is but one of the manifestations of the general disease including the amnesic symptom-complex and multiple neuritis. Bonhoeffer estimates that the Korsakoff syndrome is met with in 3 per cent. of cases of chronic alcoholism, and Chotzen found it present among female inebriates in 20 per cent. of the cases, i. e., that it is nearly seven times more frequently met with in women than in men. Statistics from Switzerland for 1901-1905 (Marie Kasperowicz) show Korsakoff's psychosis present among 246 alcoholics (209 men and thirty-seven women) in 3 per cent. of the men, and 10 per cent. of the women.

Pathogenically, there may in such cases be said to be two toxic causes active: a chronic one, usually based on the alcoholism, giving rise to the psychopathic disposition and the multiple neuritis, and an acute intercurrent one, to which the psychic symptoms may be ascribed, proving the correctness of Korsakoff's understanding of a toxic etiology. Mönkemöller claims that the presence of a digestive disturbance in the alimentary tract can be demonstrated in nearly all cases. Acute infections may run a course leading to the development of the Korsakoff syndrome, which is even quoted in the original description of the disease. Bonhoeffer mentions attacks of enteritis, dysentery and especially typhoid fever, also meningitis, articular rheumatism and puerperal fever as occurring in the early history of cases of Korsakoff. Lapinsky reported in 1908 two cases developing in the puerperal period and collected reports of four others

from the literature. In the literature of the year 1909 there are several cases mentioned following erysipelas. Such cases show an acute delirious or stuporous beginning with fever and anxious states mixed with persistent persecutory ideas, the psychotic picture resembling at times that of amentia. Bonhoeffer suggests as the only differentiating feature, so far established between this and the alcoholic form, that in the latter the history shows frequent intercurrent deliria and a euphoric-witty state of the affects. In illustration of the typical Korsakoff connected with chronic alcoholism I append another case observed at the State Hospital, in which the amnesic syndrome developed in a man who had been drinking to excess for twenty years and who went into further excesses when discharged. He had not previously had attacks of delirium, but on a trip east he contracted an acute bowel complaint which developed a marked delirious state. Memory defects had been observed before he went east, but the acute intercurrent was followed by a rapid exacerbation of the amnesic symptoms. The case showed a defective recording faculty which was more marked visually than aurally. Neuritic symptoms were present.

CASE 2.—Patient.—J. M. F., native of Connecticut, aged 60 years, telegraph operator, married, had two children living. Father drank; no history of neuropathy in the family as far as known.

History.—Patient had been a hard worker, devoted his whole life to telegraphy; was very intellectual, made a number of inventions now bearing his name and was manager of the Western Union Telegraph Company in an eastern city. He came to California twenty years ago, working for the company here at a lower salary, which loss in income made him worry greatly and drove him to excesses in liquor. He drank to some extent before, but during the last twenty years he had been drinking steadily, indulging in whiskey only. He would drink to excess short of visible signs of intoxication, but is said never to have had an attack of delirium tremens. He was a man of violent temper, nervous, irritable and of a jealous disposition. He had complained for a year or two of what he called rheumatic pains in all extremities, especially the lower. The pain seemed to extend along the whole length of the extremities, which for some time had been quite sore to the touch. About a year ago he made a trip east to recuperate. He had been drinking heavily and was unable to fill his position at the office. On the trip he was taken ill and, while east with a relative, suffered from an acute bowel complaint, was delirious for a week or two and suffered very much from renewed pains in the extremities. On his return to San Francisco in July, 1905, he was better, but his forgetfulness had grown worse and he showed incapacity for work. In October, 1905, he was dismissed from the service. He began to give exaggerated and invented accounts of events and seemed subject to persecutory ideas—people were trying to harm him, were not friendly to him as formerly—he was being "doped"—people were following him. His memory gradually deteriorated until he would talk about having been at work in the telegraph office when, as a matter of fact, he had been wandering aimlessly about the streets.

Examination.—When admitted to the hospital Feb. 17, 1906, he was found to be a man fairly erect for his age; his gait was unsteady; he complained of pain in the lower extremities and formications, but there did not appear to be any marked anesthesia present, nor any perceptible muscular atrophy. The muscles of the lower extremities were flabby, and seemed sensitive to pressure over the calves. The nerve-trunk also seemed sensitive to pressure. A marked fine tremor was present in the hands, tendon-reflexes were somewhat diminished. There were no pathologic symptoms about the cerebral nerves, speech was normal and free from tremor. Examination of eyes showed nothing pathologic. The pupils reacted slightly and tardily to light; a marked arcus senilis was present. The physical examination of chest and abdominal organs revealed

nothing pathologic; the pulse was regular; some arteriosclerosis was present in the radials. No subjective symptoms of indigestion; tongue was slightly dry and coated; bowels regular. The patient was very restless, walking constantly up and down the hall and was talkative; he talked coherently and intelligently but was not oriented. He thought it was about December, 1879 or 1880; that he was railroaded into the Stockton asylum and from there taken to this place ("Isn't this Lodi?"). His memory was quite defective as to events in the immediate past.

Course of Disease.—Two days after his admission, about 1:30 p. m., he was asked when he came here. He said: "I came here this morning—no, let me see, it was this afternoon I came here." "What time did you come here?" "Why, I came here at 4 this afternoon." After conversing on other subjects for a few minutes, the subject was returned to and he said, without hesitation: "I came here yesterday." He did not seem to be subject to visual or aural hallucinations, but talked about persecution in a general way; his powers of observation were blunted as showed by tests in arithmetic and with pictures. The defects observed in testing visually were greater than by aural tests. The superficiality of his visual observations was strikingly illustrated by the following occurrence: A patient threw some horse-manure into his room through a window. F. picked it up and put it into his pocket and afterward commenced to chew it but soon spit it out, trying to conceal from the attendant that he had deceived himself. He still had a craving for liquor and entered the attendant's room many times daily asking for a drink of whiskey, saying the doctor said he could have two drinks daily. On March 23 he entered the room of another patient by mistake—he insisted, however, that it was his room. As he refused to leave, the other patient struck him in the mouth, cutting his lip slightly. When spoken to about it, he at first denied that he had been struck, appeared to have forgotten it until the attendant walked up to him and touched his chin. "Oh, yes, a beast of a man struck me." He was often heard afterward telling about having been struck by someone, he didn't know whom—giving an exaggerated account of the affair: saying that five teeth had been knocked out of his mouth and inventing other details. He was not cognizant of the day of the week or month; thought he was in a retreat 40 miles from Stockton. He still had a craving for whiskey (March 24), came to the attendant a few minutes after it had been denied him and asked again for whiskey, having forgotten that he had just begged for it. He could not remember the simplest word three minutes after it had been told him and he was unable to recognize the word among six or seven other words mentioned to him.

March 28: F., who has not been out of the ward, says he had a long walk day before yesterday. "I walked 2 or 3 miles and was all over the city and I talked with a number of people, but not a single one treated me or offered me a drink. I haven't had a drink in this place for a week" (had been given a small quantity this morning). Asked what he was doing in Stockton, he said: "I chatted with people about my affairs; it was about things that would not interest you (in an irritable mood)—I didn't call at the telegraph office." "Didn't talk to the operator, you say? Why, there are fifty operators in the office." Asked what office he referred to, he said: "Why, in the city of San Francisco."

April 1: F. calls his attendant Charlie Myers, whom he has known since he was a kid in San Francisco. His physician's name he doesn't remember until he has looked it up in a letter and finds it to be Cleverton. (His wife uses this name in her letter speaking of the attendant.) He has never met his physician (who has seen and conversed with him daily) in this house before, but "we have met before in San Francisco." Where did we meet Mr. F.? "Oh, I met you in the telegraph office."—When? "A month ago—talked with you in the afternoon about going out to see my daughter."

June 18: The patient complains this morning that medicine has been placed in his coffee and soup; they have a queer taste.—"I sleep very little, if any, before midnight (the night attendant reports that he sleeps well) on account of pain in my legs. When this is most severe, there is a marked absence

of pain about my heart. Some things are happening that I dare not speak of—right here in this house. I wish I could say what I want to say about this man (his nurse), but he has so much authority that I dare not. He is planning to keep me here so he can cohabit with my wife. He has gotten into her good graces and it is to his interest to declare me crazy and keep me here. I am going to have this matter investigated by the governor of the state. I am 72 years old now (he is 69 years), too old, I fear, to get any permanent relief from my physical ailments. I have lived two years more than the allotted life, have been very active until about a month ago when the W. U. took pity on me and gave me a lay off. Reports have been sent in to the manager of the W. U. that I was being maltreated here and he has investigated it and found it true and has made application for my discharge. I was working for the telegraph company during the months of January, February, March, April and May, until the first of this month" (he has not worked there for about nine months).—After a few moments when he was asked about his maltreatment and the report just spoken of, he replied: "I did not say anything about being maltreated. The manager of the W. U. and others in the office are jealous of me and wish me kept in a place of this kind. It was through their instigation that 'dope' was put in my coffee and soup, while I was stopping in a hotel in San Francisco before coming here. I never had this pain in my limbs and trouble with my heart until they began to give me this dope."

June 30: "I slept very well last night—could not detect anything in my breakfast. I think they have found out that they have been reported and are now going to let up on it. My wife has filed application for my discharge and it has been favorably acted on. I will be discharged in a day or two."

July 6: He still complains of the neuralgic pains in his calves and thighs. Says his wife was here to see him a month ago (she visited him three or four days ago). When the patients are called from the yard to the wards for dinner or supper, F. never fails to ask his attendant which is the right door for him to enter.

August 23: F. says to-day that his wife was married to the attendant of his ward last night and that the reception room was brilliantly lighted and he could hear music. He was willing she should have her divorce but sees no reason why he should be held here, as there is nothing the matter with him more than that he suffers from neuralgia.

October 3: F. seems less subject to persecutory ideas; ideas of jealousy are not so pronounced, but defects of recording faculty and confabulation continue. He was taken out in the asylum grounds in the care of a patient to-day.

December 15: F. came hurriedly to the attendant to-day and reported that he had found a man lying dead in his room. The attendant, on investigating, found a patient lying on the floor asleep in some other room (not F.'s). This patient did not waken when spoken to (F. had only spoken to him), but when shaken by the attendant he got on his feet and acted as usual. F.'s memory defects, etc., have continued the same for the last two months.

January 7: F. strayed into another patient's room and asked him what he was doing in his (F.'s) room, telling him to get out, when this patient struck him in the face causing a dislocation of the nasal cartilage.

February 5: F. says to-day to his physician: "You put a telephone to your ear and thumped me around yesterday and located the break" (no examination had been made of him but he probably observed an examination of an inmate of his ward made some days ago). He thought that the injury he received a month ago was in his chest.

February 15: F. tells his wife (to-day) that he was struck in the temple by a patient some time ago, who cracked his skull clear across his head. (He referred to the time when a certain patient struck him on the jaw in September last year.)

March 7: F. says he fell to the floor unconscious twice yesterday. (No one saw him sick or prostrate on the floor.)

From this time on, the patient showed the same symptoms of amnesia, disorientation and confabulation, but to a less extent—was out on parole but in the care of another patient,

as he would repeatedly lose his way when left unattended. He died Dec. 10, 1907, from an acute colitis complicated with an acute bronchial catarrh which became capillary.

In line with the action of chronic alcoholism and the various forms of acute infection, as basis to the Korsakoff syndrome stands the chronic poisoning induced by certain toxic substances. Haymann reports a case of Korsakoff psychosis in a woman aged 31, who was habituated to the use of morphin hypodermically. During the period of deprivation of the drug, she suddenly developed polyneuritis with the amnesic syndrome which, however, disappeared after fourteen days. In 1900, an extensive epidemic of arsenical poisoning was observed in Manchester, England, due to the accidental contamination of beer. Among the many cases, Dr. Reynold reported a number of patients presenting symptoms of Korsakoff's psychosis of a milder type than those usually observed in connection with alcohol. It has also been asserted that chronic lead-poisoning may be attended by this group of symptoms. Traces of Korsakoff's syndrome have been reported in connection with poisonings by inhalation of carbon monoxid, but the memory-defects observed were more diffuse in character and the confabulations not pronounced. Meyer of Königsberg reported a case two years ago, developing three weeks after the inhalation of the gas. The Korsakoff syndrome subsided after a time, but recovery was not complete.

Retrograde amnesia has been well-known as a manifestation following attempts at strangulation, and this has occasionally been associated with a defective recording faculty, disorientation and confabulation, the symptom-complex developing in the track of a certain delirious state and epileptiform convulsions which frequently result from the strangulation. Tumors of the brain have also been recorded by some writers as leading to the development of the Korsakoff symptom-picture. Bonhoeffer has especially found it in connection with sarcomata of the brain, without regard to any definite location, but in such cases the mental vivacity is absent, the patients being more or less stuporous and the confabulations rarely observed and less spontaneously produced. Jolly and Soukhanoff have first called attention to the relationship of the amnesic syndrome to lues cerebri and general paralysis. In the latter disease the symptom-complex has been comparatively rarely observed. Three cases with a statement of anatomic findings were reported some years ago by Meyer and Riecke.

The third case of the Korsakoff syndrome, observed by me at the Stockton Hospital, proved to be a case of general paresis. It was quite atypical and for a time the diagnosis was thought to lie between cerebral tumor and lues cerebri. The amnesic symptom-complex was, as it were, set in a frame of aphasic disturbances and visual hallucinations. These hallucinations were quite characteristic of alcoholism and no doubt were referable to the patient's former alcoholic excesses, which may perhaps also have played a certain rôle in the origin of the Korsakoff syndrome. In the course of time, apoplectic attacks, however, became a frequent occurrence and a general enfeeblement gradually effaced the distinctness of the amnesic and aphasic symptoms so that the nature of the disease seemed definitely settled before the fatal termination, and was further corroborated by the post-mortem findings. The chief features of the case bearing on our subject herewith follow:

CASE 3.—*Patient*.—F. E. S., a native of California, aged 45 years, painter and paper-hanger, married, father of one child

(his wife had two miscarriages prior to birth of child), was admitted to the Stockton Asylum, March 9, 1906, his first commitment to a hospital for insane.

History.—When a child he was said to have had an attack of typhoid fever; had not been seriously ill otherwise. He used to drink to excess when a young man, but had not been drinking for a year or more. Some years before admission he had an attack of painter's colic. About five months before admission he suffered a "sunstroke" and fell from a building on which he was working, sustaining a fracture of left humerus and of a couple of ribs. The mental symptoms had been observed since this accident. His wife said he was always on the go when not working; was never contented anywhere. The commitment paper states that he had been restless, that he had lost in flesh and had been destructive—making threats against his sister, that he was not able to attend to any business and was subject to visual hallucinations. Previously, he had always had plenty of work to do, but of late he would act so queerly that old patrons would not give him anything to do, which made him worry so that he attempted suicide two or three times during the past year. His wife said he had seemed partly paralyzed. Whenever he picked up anything, he would drop it and complain that he had no feeling in his arms, which felt numb to him. He also began to suffer from sleeplessness.

Examination.—When examined in the hospital he was found fairly well nourished; his height was 5 feet 5½ inches; his weight 138 pounds. The facial expression was dull, there was a bloated appearance in the face. Examination of the eyes showed tardy reaction of pupils to light, no muscle-symptoms, normal fundus. His speech was slightly tremulous, but there was no inarticulation; there was coarse tremor in the tongue and hands; no facial inequality nor paralysis of tongue or palate. Romberg was slightly present; no motor or sensory paralytic symptoms; no marked sensitiveness about nerve-trunks or muscles on pressure. Tendon-reflexes were increased; skin-reflexes about normal. Heart and lungs were normal. Pulse 75, regular, slightly arteriosclerotic; temperature and respiration normal. Tongue moist, slightly coated; bowels regular; urine normal, specific gravity 1.021. He was slow in understanding when spoken to, but was frequently talkative, restless and excited. He gave evidence of being subject to visual hallucinations; at times he saw horses, cattle, lions and panthers all around him; he lifted his feet as if afraid of stepping on imaginary things on the floor. He was not oriented as to time or place; thought he was in a court-house at Woodland (his native town); he said it was 1895; did not know the month or day of the week. Amnesia was present; he did not remember the name "Victoria" after two minutes. In his talk with the examining physician he confabulated: "I had dinner with you and your wife, and the young boy too—it was at Woodland." A few minutes afterward he had forgotten all about saying so.

Course of Disease.—The patient was picking imaginary objects from the floor; a big worm, a screw, etc. He said to the attendant: "There is a white worm on your neck." When told to pick it off, he fumbled about the attendant's neck a few minutes and then held out his hand saying: "Here it is—it is alive yet—it is a young one." Pointing to the floor a few feet away he smiled and said: "Isn't that a nice dog? I wonder to whom it belongs—here, puppy, puppy." Afterward he said: "I want to get out now and go to see my mother, I haven't seen her for over a week. She told a man just across the street that she wanted me to come home, she is going on a long journey, I believe."

March 12: S. seems to realize his surroundings to-day and is quiet. He saw all sorts of animals and objects, but these visual hallucinations seem to have disappeared to-day.

March 24: S. was much confused last night, roaming about his room, upsetting his bed, urinating and defecating on the floor. A cow got into his room, chewing him up; he saw snakes of all kinds and was trying to catch imaginary horses in his room.

April 8: S. has been somewhat oriented as to time, but confused as to his own condition and circumstances during the past three days.

May 27: S. had an epileptiform attack at 7:30 a. m. to-day. After the attack he slept for two or three hours and was silent most of the time afterward. The next day he talked, but was confused; word-deafness was present and he did not seem to recognize objects. He also mixed words, misapplying them and speaking in an unintelligible jumble: "I got the pipe, the poron of it right here—right here, the stove here, I right here, stove, the room. Right here in the stove. I am in the pipe. It ain't my room; it is the room. Here is where I sleep. How are you feeling to-day?" "Yes. Well, I stood that. Well, that is natural—good." He used his hands as if handling invisible objects (pulling at strings, disentangling wires). Slight inequality of pupils (left greater than right) is present.

May 30: S. is still confused; shows disorientation as well as defective memory and confabulation. Visual hallucinations are likewise present. He is seen swinging his hands with an imaginary spider at the end of its thread—warning those around him not to come near him or they will be poisoned. Aphasic symptoms have almost disappeared.

May 31: S. was very noisy last night. He thought the walls were falling in on him. To-day he seems a little better.

June 2: S. is better to-day, but still confused and confabulates as usual: "My brother was out hunting last Sunday and he was accidentally killed." (Adding this when asked about his brother, who lives in Stockton and calls on him now and then.) His speech is still a little inarticulate, but not aphasic.

June 29: S. had a second epileptiform attack at 9:30 a. m., to-day, which lasted till noon. After this he remained more or less unconscious for twenty-four hours.

July 1: S. again speaks plainly when talking to imaginary worms and spiders. He is noisy at times; he occasionally begins to give intelligent answers to questions.

July 4: He has some trouble in using his right arm. Will speak when spoken to. Speech is tremulous and lips show marked muscular tremor when he speaks. He continues to improve in a general way.

July 10: He had the third (mild) epileptiform attack at 2:45 p. m., from which he recovered in two or three days, after which the symptoms of visual hallucinations continued as before. He begins to show an inclination to rhyme words, but his speech is much less inarticulate and aphasic. He had a fainting spell on August 4, from which he quickly recovered. About this time he would on some days suddenly lose his power of speech; he would mumble words which could not be understood and would appear dazed for hours at a time. After an attack of this kind on August 12, his right arm became completely paralyzed.

August 16: He is able to walk about in the yard as usual, but is again engaged in killing imaginary animals, drawing gold wire from the floor and at times becomes very excitable. His voice is tremulous and he talks with great effort.

August 23: He had a hemorrhage from the bowels, with symptoms pointing toward the existence of an ulcer in upper part of small intestine.

He was put on a diet and the hemorrhage did not repeat itself, but his speech disturbances became gradually more marked, more paraphasic as well as dysarthritic, so that on September 5 he could only say certain words as "well" and "yes." In the course of the following week he again improved so that his speech became intelligible and the right-sided hemiplegic symptoms subsided, but he became very untidy, developed decubitus and showed a gradual weakening mentally. During the months of October and November he improved somewhat physically but he became slow in understanding, required repetition of questions many times to grasp the meaning, and his talk was rambling. Word-deafness was again present. When asked about the name of a place he replied: "What is that he says—gas-pipe?" Although his bedsores had healed, he gradually grew weaker. His condition in general remained about the same until Feb. 14, 1907, when he had a fourth epileptiform attack, which repeated itself four days afterward and he died in a comatose condition on Feb. 19, 1907.

Post-Mortem Examination.—This showed adhesion of the dura to the bone over large areas of the cranial surface, a very large quantity of fluid in the pia-arachnoid, which was found thickened and milky and very adherent to the cortex, especially about the frontal lobes where the gyri were flattened and much narrowed, the cortex being in the frontal, parietal and temporal lobes of both hemispheres markedly attenuated. Hydrocephalus internus is present—the lateral ventricles being about equally much dilated, and the ependyma showed marked granulations. The hypophysis was found much hypertrophied, was indurated to the touch and showed the presence of psammomata. Perpendicular section of the left inferior frontal gyrus in its lower part, adjoining the anterior central, showed the presence of a softening of the size of a small bean, situated in the medullary substance just below the cortex. Otherwise no foci were found. Arteriosclerotic changes were very marked in the internal carotid, basal and vertebral arteries.

Some months ago Dr. Ernst Thoma of the Illenau Asylum in Baden, Germany, reported the histologic findings by autopsy of two cases of somewhat chronic types of Korsakoff psychosis. He found, besides a thickening of blood-vessel-walls and vascular proliferation to a less extent than in paresis, a diffuse degenerative process in the entire nervous system, which showed itself as a disease of the ganglion-cells resembling that of a general paralysis. He also found a degeneration of the medullary fibers of the brain and a proliferation of the glia-cells as well as of the glia-fibers to replace the loss of the medullary substance. It had been claimed by some that these changes were especially marked in the frontal and parietal lobes, but this claim could not be established by Thoma's investigations. The histologic findings have, of course, varied some from the above in the very acute cases terminating fatally in the early part of the disease. A lymphocytosis has been demonstrated in the cerebrospinal fluid in one case of an alcoholic type of Korsakoff's syndrome, and in another similar case was found Nonne's Phase I, of clouding of the cerebrospinal fluid on addition of ammonium sulphate, with further increase of cloudiness on addition of magnesium sulphate.

It is difficult to definitely place the prognosis in a case where the annesic symptom-complex shows itself. It is usually met with in very severe brain disturbances, but observations in cases where it has developed after strangulation show that restoration is possible. The prognosis is also tolerably favorable in cases with an infectious etiology and cases in which the syndrome has attended arsenical and carbon-monoxid poisoning. On the other hand, the prognosis is more or less unfavorable where the disease has developed in previously unhealthy brains, following severe forms of alcoholism or in arteriosclerotic and senile cases.

Experience has shown that exercise of the recording faculty with retracing of past observations will under favorable circumstances lead to improvement of the Korsakoff manifestations, in the manner that memory exercises have given favorable results in aphasia.

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ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. SMITH AND HOISHOLT

DR. S. GROVER BURNETT, Kansas City: Korsakoff's disease is a condition we meet frequently but is rarely understood. The general practitioners overlook this condition time and time again, and we see patients going to asylums as insane persons. This, I do not think, should occur. It is an old disease, first described by Korsakoff, and I would say that I recorded my first case in 1886, one year prior, or two years

prior to the publication by Korsakoff. This case of mine has since been published. I recorded one case resulting from lead poisoning. I am glad to hear the essayist bear me out in this. You will remember that lead poisoning manifests itself in motor palsies ordinarily. Korsakoff's disease is manifested in sensory palsies attacking the mental impulse carrying sensory neurons, producing mind symptoms—Korsakoff's syndrome—while lead poisoning affects the motor neuron-producing motor symptoms. I have seen two cases in the past year following morphinism. They were both chronic morphin cases.

DR. R. P. SMITH, Seattle: In the case I reported Korsakoff's symptoms were present. They developed possibly a week after we found paralysis of the tongue present, and it was five or six days after the symptom of the twelfth nerve paralysis had cleared up before the Korsakoff symptoms had disappeared.

POSTOPERATIVE RETENTION OF URINE AND CYSTITIS *

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The occurrence of postoperative cystitis is still of sufficient frequency to warrant a discussion and presentation of some of the newer thoughts and methods for the prevention of this condition. A troublesome postoperative cystitis, either temporary or permanent, has often spoiled an otherwise excellent surgical result.

Heretofore a postoperative cystitis has been considered by many authors solely as a cystitis due to catheterization. While this view is largely correct, it is our purpose to show that preventable, abnormal anatomic conditions of the bladder, dependent on the surgical procedure itself, are in many cases the real predisposing etiologic factors in the production of the complication, and that the catheter *per se* is for the most part merely the exciting cause.

All authors agree that for the production of a cystitis it is necessary to have, besides the bacterial infection, one or more of the following predisposing factors, i. e., retention, trauma, or congestion.

According to Caspar¹ and Freyer,² the following organisms, named in order of frequency with which they are present, are to be considered as the cause of cystitis: *Bacillus coli communis*, *B. proteus vulgaris* (Hauser), *B. tuberculosis*, *Staphylococcus ureæ liquefaciens*, *Streptobacillus anthracoides* and *B. typhosus*, *M. gonorrhææ*. Abundant experimental evidence has demonstrated the fact that pathogenic organisms may be present in the bladder without producing cystitis, but that certain conditions favorable to their growth must be present before a cystitis will develop. In the normal urethra numerous bacteria have also been found which, as a rule, are non-pathogenic and remain latent so long as they do not enter into the bladder under conditions which predispose to cystitis.

Baisch³ found that when the urine, aspirated from the bladder during laparotomies, or colpotomies, was examined bacteriologically, the clear urine of women contained no germs. Enriquez, Franz, Hofmeister and

Melchior, have shown that the last portion of spontaneously discharged urine almost always contains germs, even after the most careful cleansing of the urethral orifice, although Melchior succeeded after repeated preliminary irrigation of the urethra in obtaining a practically sterile urine.

Baisch,³ in his most excellent bacteriologic work on this subject, says that the number and kind of bacteria found in the normal urethra are dependent on the condition of the vestibule and vagina, and are subject to the greatest of variations. The bacteriologic findings in the puerperal women differ from those in the pregnant, in the healthy from those in invalids, and in patients operated on from those in patients not operated on. As the colon bacillus was the most common organism found in his cases of cystitis, Baisch endeavored to ascertain the source of the *B. coli* when the examination fails to disclose it in the vulva or the urethra. He believes that his examinations of the vulvar and urethral secretions of bedridden patients, operated on and not operated on, have solved the question. The bacteriologic examinations on forty-five operated patients who were positively known not to be affected with cystitis, gave results as follows: no culturally demonstrable organisms in the vicinity of the urethra and in its lowermost section, on the eve before the operation (after the usual disinfection of the external genitalia); on the second day staphylococci were already found (*albus*, less often *aureus*), and from the third, fourth and fifth day on, in addition to these, the *B. coli*. The presence of staphylococci is explained by the general spreading of the skin-germs, and of the *B. coli*, by the vicinity of the rectum and anus. Systematic daily examinations of the urethral and vulvar secretions in patients not operated on but bedridden showed that although no colon bacilli were present on the day of admission, they were invariably found in the urethra and vestibule after lying in bed for a few days.

Urinary retention or ischuria is the most common complication which predisposes to an inflammation of the bladder following surgical operations. This takes place either by a direct backward invasion of the organisms of the urethra, owing to the absence of the mechanical cleansing effect of the urine during the act of micturition, or it follows the introduction of organisms into the bladder from the use of the catheter.

Many theories are advanced in explanation of postoperative retention of urine, among which are especially to be mentioned: the inability of some patients to urinate in the recumbent posture; a neurosis especially in nervous individuals; a reflex condition, contributed by the sympathetic nervous system producing urethral spasm and vesical paralysis; disturbances of the intra-abdominal pressure; paralysis or atony of the detrusor muscle from toxic substances similar to postoperative atony of the intestine; trauma of the peritoneal covering of the bladder; interference with the blood- and nerve-supply to the organ and a swelling or edema of the mucous membrane about the internal urethral orifice.

The relief of urinary retention by catheterization of the bladder has long been known to be a very frequent cause of postoperative cystitis, so much so as to lead many authors to consider it always as a "catheterization cystitis." There can be no question that the catheter is the most important single exciting factor in the production of a cystitis. This is explained by the trauma of the mucous membrane of the urethra or bladder incident to its introduction, and by the conveyance to the bladder

* Read in the Section on Obstetrics and Gynecology of the American Medical Association, at the Sixty-Second Annual Session, held at Los Angeles, June, 1911.

1. Caspar: Genito-Urinary Diseases, English Trans., 1909, p. 1208.

2. Freyer: Surg. Diseases of the Urinary Organs, 1908, p. 237.

3. Baisch, K.: (Univ. Tübingen) Bakteriologische und experimentelle Untersuchungen über Cystitis nach gynäkologischen Operationen, Beitr. z. Geburtsh. u. Gynäk., Leipzig, 1904, VIII, 297.