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Hope for Japanese Psychiatric Brain Bank

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Editorial

As one of the founders of German psychiatry, Griesinger (Wilhelm Griesinger, 1817-1868), mentioned in his text, 'Pathologie und Therapie der psychischen Krankheiten (1845)' that 'mental illness is a disease of the brain' (Geisteskrankheiten sind Gehirnkrankheiten), promoting the place of psychiatry among modern medicine, and denied the occult interpretation of mental illness after the medieval period represented by witch-hunting. Based on this thesis, he promoted the scientific concept of seeking the origin of mental disease in the brain similarly to other physical diseases. This is the whistling arrow that led to the current biological psychiatry. Griesinger also proposed Einheitspsychose (Unitary psychosis), stating that the basis of various mental diseases causing psychosomatic symptoms is a single mental illness.

Adopting this concept of Griesinger, Kraepelin (Emil Kraepelin, 1856-1926), who laid the foundation for German psychiatry, aimed at elucidating the biological causes of mental disorders. From these research activities, leading authorities of neuropathology appeared in a large number, such as Alzheimer (Alois Alzheimer, 1864-1915), who discovered the disease unit of Alzheimer's disease, and his pupil, Lewey (Frederic Henry Lewey, 1885-1950). At that time, psychiatry and neurology were not divided as they are now, and they developed as neuropsychiatry.

At the dawn of psychiatry in Japan, we looked for a model in German psychiatry. In the Japanese modernization era, many Japanese psychiatrists studied in Germany and absorbed and imported German psychiatry. One of the persons who acted as a driving force was Shūzō Kure (1865-1932). He promoted brain pathology research in the psychiatric field with the modernization and reformation of psychiatric treatment in Japan. He imported brain histological techniques, such as Nissl staining, from Germany, and performed systematic brain sectioning in the psychiatric field at a psychiatric hospital. Around that time (1913), Hideyo Noguchi (1876-1928) confirmed the frequent presence of a pathogenic spirochete in the brain of patients with progressive paralysis hospitalized in psychiatric hospitals, and identified the cause of the disease.

However, the cause of disease and pathology of mood disorders including schizophrenia and depression are still mysteries in the psychiatric field. These diseases had been actively studied from the era of Kraepelin using neuropathological techniques, but this methodology had limitations and neuropathology started to decline in the psychiatric field, with it being said that 'schizophrenia is a graveyard for neuropathologists'. In the 1980s, morphological changes and the abnormal running of nerve fibers in the brain of patients with schizophrenia were suggested by neuroimaging studies conducted one after another. In addition, it was said that when genes composing the brain (i.e., blueprint of brain tissue) are clarified with the progression of molecular psychiatry, the causes of mental diseases will be elucidated. Actually, several candidate genes were discovered in schizophrenia patients, and the involvement of many functions of these genes in neural network formation has been clarified. In addition, model animals were prepared based on a risk gene, the DISC1 gene, identified in a multiplex schizophrenia family, and several neuropathological abnormalities have been discovered by neuropathologically investigating this model. However, for studies using these model animals, verification in the postmortem human brain is essential. Moreover, the cause of disease and pathology cannot be elucidated by neuroimaging or molecular-psychiatric studies alone, and these studies require convergence by confirming the histopathology of the postmortem human brain.

However, brain tissue as a study resource had not been accumulated in Japan because neuropathological studies for psychiatry declined. Moreover, the autopsy rate is generally low in Japan compared with those in Western countries, perpetuating the difficulty in acquiring resources, being a major obstacle to the promotion of studies in Japan, and many Japanese researchers inevitably depended on brain banks of Western countries. The Japanese Society of Biological Psychiatry has investigated the necessity of a 'Japanese version of the psychiatric brain bank' to promote research

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in Japan for about the last 10 years, and ethical, methodological, and technical problems have been discussed referring to the preceding brain banks of Western countries. Through these academic activities, a project to accumulate brain tissues was initiated by the Japan Agency for Medical Research and Development (AMED) in 2015 using national research funds. At present, several institutions in Japan have collaborated and started a 'Japanese version of the psychiatric brain bank' through accumulating postmortem brains of patients with mental diseases and neuropathy.

In neuropathy, there is a historical background of brain resource accumulation in the neurology field including that of dementia, but it is very difficult to replace diseased brain tissue once they have been depleted. Even so, the thesis of Griesinger, 'mental illness is a disease of the brain', has guided the history of psychiatry, and it is clear that this project has to succeed to overcome mental diseases. Therefore, I will promote psychiatric clinicians' awareness of the medical necessity of the brain bank and inform patients of the importance of donating brains for medical research, and construct a Japanese version of psychiatric brain bank comparable to those of Western countries, expecting it to play a major role in overcoming all mental diseases through cooperation with brain banks of Western countries and effective utilization on a global scale.