My Academic Life in Neuropathology

Asao Hirano, MD

Editors’ Introduction

The following reminiscence by Asao Hirano is the third autobiography in a series published in the Journal of Neuropathology and Experimental Neurology. These have been solicited from senior members of the neuropathology community who have been noted leaders and contributors to neuroscience and to the American Association of Neuropathologists (AANP) and have a historical perspective of the importance of neuropathology in diagnosis, education, and research. It is hoped that this series will entertain, enlighten, and present members of the AANP with a better sense of the legacy that we have inherited, as well as reintroduce our respected neuroscientists as humans having interesting lives filled with joys and sorrows, the same as all of us.

MNH, RAS

I was born in Tomioka, a small town in the mountainous area of central Japan, on November 26, 1926. Growing up as the only child in a Samurai descendant household, my childhood days were disciplined and happy (Fig. 1). At school, I excelled in all subjects and won many prizes in art (drawing) and sports (running and judo). Even during the difficult war period, I was fortunate in being able to pursue a relatively uninterrupted academic life. From premedical college in Niigata, I went on to Kyoto University, and graduated from the Faculty of Medicine in 1952. At that time, internship was introduced to Japan from America as part of a new medical educational system. I was one of 2 physicians accepted into a 1-year rotating internship at the US Army Hospital in Osaka. This gave me an opportunity to learn not only the American style of clinical medicine, but also conversational English from the American doctors stationed in Japan. With their recommendation, I was accepted for a 1-year rotating internship at Harlem Hospital in New York City, which was an exciting big event for me! Dr Shukuro Araki, a graduate of Kumamoto University Medical School, was my fellow intern at Osaka Hospital. Together, we went to see his uncle, Professor Chisato Araki who was chairman of the Department of Surgery at Kyoto University. Prof Araki had studied neurosurgery at the University of Chicago before World War II and was a pioneer of neurosurgery in Japan. It was his recommendation that we went to study neurology in America because no proper neurological training center existed in Japan at that time. We both decided to follow this valuable advice. This was the starting point of our respective academic careers. Dr Shukuro Araki would return to Japan after a few years to become one of the leading neurologists, and I would stay in America to pursue my research career as a neuropathologist. I left Yokohama seaport in May 1953 on a Japanese cargo ship with a 1-way ticket and 30 dollars in cash, which was the maximum limit for any Japanese going abroad in those days. I arrived in foggy San Francisco, crossed the continent by train, and came to New York City.

After a year of the rotating internship at Harlem Hospital, I began the first year of neurology residency training at the New York University Division of Bellevue Hospital in New York City. I started to learn neurology from the first step here in an academic atmosphere. Everything was fresh, new, and exciting to me, and I was very happy. It was beyond my imagination to be able to study neurology with full support of food, clothing, and shelter without paying tuition. After a year of training, I started to feel the pleasure of making my own clinical diagnoses in some patients with neurological conditions.

Like Harlem Hospital, Bellevue Hospital is a city hospital in Manhattan. Many of the patients were brought into the emergency department with head injuries, infections, and other acute illnesses. Interns and residents were on the front line, very busy examining and treating these patients. For example, we did percutaneous carotid angiography to demonstrate a subdural hematoma and then transferred the patient to neurosurgery. It was a rewarding experience to see the dramatic recovery of a patient after surgery. We worked very hard day and night in a very active hospital. Meanwhile, Dr Shukuro Araki was getting neurology residency training at Montefiore Hospital in the Bronx, NY, after a year of a rotating internship at a private hospital in Los Angeles. Montefiore was a chronic disease and teaching hospital affiliated with Columbia University at that time. It was located in the northern part of the Bronx and used to be surrounded by quiet meadows. Unlike Bellevue, many patients with neurodegenerative diseases were hospitalized for long-term care. Patients with amyotrophic lateral sclerosis (ALS), post-encephalitic parkinsonism, Parkinson disease, Huntington disease, Wilson disease, multiple sclerosis, and other well-known neurological entities were hospitalized in approximately 60 male and 60 female beds. These patients had been studied thoroughly, and they became a living textbook in neurology.

I decided to accept a second year of neurology residency at Montefiore. In this institute, in addition to examining patients and attending meetings, I was able to spend enough time to sit and read the thick hospital charts of each patient in a fine well-organized medical record room. It was exciting to find the original handwriting of famous neurologists and to learn the findings of patients during a long hospital course. Learning the differences of the training systems and being
able to pick up the strong points of Bellevue and Montefiore were exciting and an ideal advantage for my training. I was fascinated by neurology because, I thought, this was the best field in medicine to be able to analyze clinical manifestations and morphological findings. Clinicopathologic conferences contributed most effectively to this approach. I felt very strongly that it was essential to have detailed neuropathologic background to make an accurate final diagnosis in neurological medicine.

Traditionally, Montefiore had a well-known strong Department of Pathology, which made more amazing strides after the inauguration of Dr Harry M. Zimmerman in 1946. I was attracted by his enthusiastic excellent lectures. I took a year of neuropathology training in his department as a third year neurology resident and started to learn the macroscopic and microscopic study of the nervous system with trainees from America and various foreign countries. In his active department, approximately 10 brains were examined at the brain-cutting conference every Wednesday. Dr Zimmerman’s weekly Thursday morning neuropathology microscopic conference was full of intense passion. These 2 conferences received high praise from every attending physician. I was absorbed in learning neuropathology from 8 AM to 11 PM every day, 7 days a week.

Immediately after its publication in July 1955, I bought the first edition of Dr Houston Merritt’s *Textbook of Neurology*. I read it very carefully from the first to the last page in 4 months. This book was the most interesting readable neurology textbook to me—a rainfall eagerly longed for! Many of the Montefiore patients I saw in the ward were illustrated, and most of the neuropathologic findings were selected from the files at the Montefiore laboratory that was readily accessible to trainees. Dr Merritt had been the Chairman of Neurology for a long time before moving to Colombia University Presbyterian Hospital. Dr Zimmerman had been his close friend and collaborator. I wished to continue neuropathology training, but Dr Tiffany Lawyer, Chairman of Neurology, appointed me as the chief resident for my fourth year of neurology training. I returned to fellowship training in neuropathology in 1958.

Between 1950 and 1960, there was extraordinary progress in neuropathology in the United States. Many powerful new techniques were introduced to traditional classical neuropathology. These included electron microscopy (EM), biochemistry, histochemistry, and tissue culture. As a beginner, however, I concentrated on learning the basics of neuropathology rather than starting research work with new techniques. So I was engaged in clinicopathologic correlation studies and illustrated the distribution of lesions using macroscopic observation of autopsy material.

My first article was a clinicopathologic case report entitled “Aneurysm of the Vein of Galen,” published in *The Journal of Neuropathology and Experimental Neurology* (17:424–429, 1958) with Dr Robert D. Terry, an attending neuropathologist whom I highly respected. There was no significant new information, and it was the ninth case of this entity in the literature. Despite that, with the big illustration of the aneurysm, it was selected by the *Yearbook of Neurology*, Neurosurgery and Psychiatry of that year, edited by Dr R.P. Mackay. This was a big surprise. I have liked to draw pictures since childhood, and my drawing has probably contributed to my understanding of the mechanisms of pathology. Encouraged by this unexpected event, I started macroscopic neuropathologic investigations of the pathways of hemorrhage caused by various ruptured intracranial aneurysm into the ventricular system, as seen in specimens stored in the archive museum of autopsy material. A series of articles was published with my illustrations of the specific pattern of invasion according to different aneurysm locations. I recently had an unexpected surprise when I found a similar picture showing ruptured aneurysm in one of the current internationally popular manuals of neuropathology, *Escourrolle & Poirier, Manual of Basic Neuropathology, Fourth Edition, 2004*, almost 50 years after my original publication.

**CLINICOPATHOLOGIC STUDY OF ALS AND PARKINSONISM DEMENTIA COMPLEX IN GUAM**

Amyotrophic lateral sclerosis was described more than a hundred years ago, but the etiology and pathogenesis of ALS has yet to be determined. In 1959, on the recommendation of Dr Zimmerman and Dr Leonard T. Kurland (Chief of Epidemiology, National Institutes of Health [NIH]), I went to the island of Guam as an NIH visiting scientist to investigate the high incidence of ALS affecting the native Chamorro population there. Amyotrophic lateral sclerosis was clinically and pathologically indistinguishable from ALS in Montefiore, but we were impressed by observing Alzheimer neurofibrillary tangles (NFTs) (which were first discovered by Dr Nathan Malamud at the Langley Porter Hospital of the University of California, San Francisco) in these Guam ALS cases. Neurofibrillary tangles were consistently present in the 70 cases of Guam ALS we examined. In contrast, NFTs were usually absent in the 86 cases examined at Montefiore.
In the late 1950s, another fatal neurological disease was discovered among the same native Chamorro population on Guam, with an incidence about equal to that of ALS. The patients had clinical features of parkinsonism, and many of them additionally showed progressive dementia. Furthermore, ALS developed in some of these patients during the course of their illness. At that time, dementia was not mentioned in either the textbooks or the literature on Parkinson disease. Therefore, we coined a new term to describe this clinical entity in Guam, parkinsonism-dementia complex (PDC). Unlike postencephalitic parkinsonism, a history of encephalitis was not elicited in any of these patients. Similar to ALS, PDC affected adults with an insidious onset and progressed to death in 3 to 5 years. We presented our observations regarding PDC in Guam at the annual meeting of the AANP in 1961; we received the Weil Award. We published this in the British journal, Brain, in 1962. Since then, patients presenting with parkinsonism and dementia have been observed in various additional new diseases affecting other populations in the world, for example, progressive supranuclear palsy, corticobasal degeneration, and frontotemporal degeneration with parkinsonism linked to chromosome 17. Furthermore, current textbooks describe dementia in Parkinson disease, notably in elderly patients, and also in the Lewy body variant of Alzheimer disease.

From 1958 to 1964, I examined 63 autopsies with neuropathologic investigation on PDC cases. Unlike Parkinson disease, the brain was atrophic notably in the temporal lobes; both the substantia nigra and locus caeruleus were more profoundly depigmented. Histologically, marked neuronal loss and many NFTs were observed not only in the pigmented regions of the brainstem, but also in the cerebral cortex, especially the temporal lobe. Pyramidal neurons in the CA1, subiculum, and glomerular formation of the parahippocampal gyrus (entorhinal cortex) were often replaced by numerous ghost tangles. Other noteworthy areas were the amygdaloid nucleus, the nucleus basalis of Meynert, the dorsal raphe nucleus, and the reticular formation of the brainstem. They were also found in the olfactory nucleus and the spinal cord, among many other regions. Stimulated by these findings, I studied the topographic distribution of NFTs in the CNS and was surprised by their wide distribution as well as the selective involvement of a certain group of neurons. Another astonishing observation was the absence of senile plaques in the cerebral cortex of Guam cases despite abundant NFTs, distinct from Alzheimer disease. Because I had not seen such histological findings in cases at Montefiore or in the literature, I was excited by the idea that NFTs can be made without the influence of senile plaques. After our report on Guam cases, extensive investigations of many publications demonstrate NFTs without senile plaques, for example, the aftermath of boxing, Niemann-Pick disease type C, in addition to previously known postencephalitic parkinsonism. Application of refined silver impregnation and tau immunohistochemical staining facilitated the study of NFTs, and there have been many additional detailed studies of these conditions. Furthermore, in addition to neurons, involvement of glia has been actively investigated, especially in Japan. Thus, currently, a group of disorders have been called tauopathies, one of the major targets of investigation of age-associated neurodegenerative diseases. The Hirano body, which is distinct from NFT, was originally discovered in the Guam PDC patients.

My wife and I went to Guam soon after our marriage. It was a beautiful tropical island rich with natural wonders. There were no hotels, golf courses, swimming pools, or other facilities to attract tourists, and there were no sightseeing visitors. In February 1992, a quarter century after we left Guam, I was able to visit the island to attend an NIH International Research Meeting on Guam disease, and I could not believe my eyes. The island now had many large beautiful hotels along the beach with swimming pools and many other entertainment facilities resembling Waikiki beach in Hawaii. The lifestyle of Chamorro population had changed dramatically as they had become much more westernized. A far more unexpected and tremendous surprise was the disappearance of ALS during this period; however, no new patients were observed. The cause of Guam ALS is still unknown, despite many extensive studies by various investigators. “Why Guam ALS disappeared” remains a total mystery.

To my total surprise, I received a commendation by the Hon. Ben Blaz (Representative of Guam), 120th Congress, Second Session, Congressional Record, 138, No. 15, and also a plaque from the US House of Representatives for distinguished services in behalf of medicine and humanity, on February 7, 1992. In these officially framed awards, the following was documented: “They were the first postwar honeymooners to visit Guam,” and “Remarkably, the Hiranos conducted their early research in the living room of their apartment, which was converted to a laboratory.”

**BRAIN EDEMA**

Brain edema is a major source of concern in neurological medicine. It is associated with almost any expanding lesion and is often the direct cause of a patient’s death. Brain edema had been the target of many light microscopic investigations; these have concluded that brain edema was, for the most part, an extracellular phenomenon like in the other organs. The advent of the electron microscope, however, created a puzzling observation. Unlike the image in the light microscope, EM investigations revealed that the normal brain was crowded with cells and processes, and there was virtually no extracellular space in the parenchyma. Initial fine structural studies of the edematous brain showed enormously swollen astrocytes with even smaller extracellular spaces than normal. It was generally considered that astrocytes were the site of fluid accumulation and subserved the role played by the extracellular space in other organs. Soon, however, 2 facts dawned on the researchers in the field. First, their findings had been mostly confined to the gray matter, whereas it was well known that edema was generally a phenomenon of the white matter. Second, the astrocytes seemed swollen even in a presumably nonedematous brain. The attendant artifacts affected the white matter even more than the gray matter and therefore led investigators to focus on the gray matter rather than the white matter.

Eventually, the development of the perfusion technique for fixation of the CNS by S.L. Palay and the introduction of...
superior embedding material permitted proper preservation of intracranial tissue, including white matter. We implanted electron-dense tracer substance into the rat brain, and the movement of edema fluid with tracer was investigated by EM. With time, the tracer moved within the extracellular space especially that of the cerebral white matter. This observation was published as the first article of volume 46 of the American Journal of Pathology in 1964. This was my first EM article. The positive response to the article encouraged me to pursue further studies of this important issue. Because of the series of subsequent articles on blood-brain barrier and its damage, I was invited to many national and international meetings on brain edema and learned a great deal about various aspects of brain edema (Fig. 2).

**UNROLLED MYELIN SHEATH**

White matter became the major target of my fine structural study of brain edema induced in experimental animals. The compact arrangement of myelinated axons in the CNS was distinctly different from that of peripheral myelin, where there is narrow Schwann cell cytoplasm with basal lamina and connective tissue containing ample extracellular space. Therefore, structural analysis of individual myelinated axons in the white matter was very difficult despite their intensive and popular study during the 1960s.

Individual myelinated axons are separated from each other in brain edema. Furthermore, fixative in the edema fluid resulted in proper fixation of the tissue, and we were able to capture nice pictures of each individual central myelinated axon. In addition to normal ones, we unexpectedly found altered myelinated axons associated with edema. We followed these changes over time with great interest and continued to take more pictures.

In the peripheral nerve, myelin is a structure produced by spiral wrapping of Schwann cell cytoplasm. This was the historical epoch-making discovery of B.G. Uzman of Harvard University. In contrast, I hypothetically unrolled the myelin sheath from the axon, similar to the way Japanese noodles are made. As a result, myelin became a board, shovel-shaped sheath of an oligodendrocyte process. I drew a schematic picture of this myelin sheath. A simple alteration of this sheath clarified various complex configurations of the abnormal myelinated axon. It was my great pleasure to see this published in one of the most prestigious journals of the field, the Journal of Cell Biology in 1967. We used to order 300 reprints for our article, and it was usually enough for reprint requests, but not for this particular article. All reprints were quickly given away, and requests continued to come for a long time thereafter. Furthermore, it was a really unexpected surprise to receive requests for reviewers’ comments for a submitted article from other neuroscience journals. This reflected the wide and deep interest in the fine structure of myelin in the field of neuroscience at that time. The schematic drawing of the myelin sheath was shown at various conferences, and its modification was widely used, especially in articles of freeze fracture techniques. A large and beautiful illustration of an oligodendroglial cell with myelin sheath was published in Scientific American in 1980. My idea has been melted in a stream of progress of neuropathology.

**NEUROPATHOLOGY AT MONTEFIORE AFTER 1965**

I was appointed as attending pathologist and head of the Division of Neuropathology at Montefiore Medical Center succeeding Dr Lucien J. Rubinstein in 1965. I could then not only make diagnoses with help of my associates in the department, but could also teach students and residents at Albert Einstein College of Medicine. In addition, it was a great privilege to be able to study neuropathology with well more than 100 research fellows who came from universities and other academic institutes, especially from Japan.

I have been a professor of Pathology at Albert Einstein College of Medicine since 1971 and a professor in the Dominick P. Purpura Department of Neuroscience since 1974. In 1974, I received my New York State physician’s license as well as board certification in Neuropathology; I became a US citizen in 1977.

As environmental changes have intensified and our civilization has advanced at ever-increasing speeds during the past half century, we have also witnessed the appearance, change, and disappearance of many neurological diseases. In addition, technological advances during the years have played an important role in shaping the development of neuropathology. As in my study of brain edema and structural analysis of the myelin sheath, many new findings have been observed with EM studies. Brain tumors were one of the major research projects in Dr Zimmerman’s department, and almost all surgically removed tumors were investigated at the ultrastructural level. Electron Microscopic Atlas of Brain Tumor, the first book of the field, was published in 1971. Two additional interesting observations are mentioned.

First, the colloid cyst of the third ventricle was reported to originate from the paraphysis, ependyma, or choroid plexus. We proposed another possibility, namely, an endodermal rather than neuroectodermal (as previously considered)
origin of the cyst. This was based upon our unexpected fine structural observation of a cyst wall that was identical to the respiratory tract. The studies of the wall of various cysts in the CNS were target of our active study. The endodermal origin of the colloid cyst of the third ventricle is now adopted in the World Health Organization classification.

The second is a nodular form of medulloblastoma. We studied the fine structure of an unusual “medulloblastoma” with extensive nodularity. It was a real surprise to find many presynaptic terminals unattached to postsynaptic spines. This finding was very attractive because it not only indicated the neuronal origin of the tumor, but also demonstrated distinct evidence of an occurrence of an unattached presynaptic terminal without a synaptic mate. I had not seen such a finding previously, and it stimulated me to study aberrant synaptic formation. This observation was opposite to the finding of unattached postsynaptic spines of the Purkinje cell previously observed in cerebellar granule cell degeneration such as in kinky hair disease. This tumor was reported as a neuroblastoma, probably originating from granule cells. It is noteworthy to point out that this variant of medulloblastoma is not malignant like other medulloblastomas.

This productive period of EM investigation was followed by an increased general interest in immunohistochemical study along with remarkable advances in molecular genetics. These are currently essential tools for diagnostic...
workup and research in pathology. An episode of discovery of strongly positive staining of superoxide dismutase 1 of intraneuronal Lewy body-like inclusions in the anterior horn cells of familial ALS was an unforgettable exciting experience for us.

I have published well more than 700 articles and 20 books, including A Guide to Neuropathology (Fourth Edition) and Color Atlas of Pathology of the Nervous System (Third Edition). To me, these are all unforgettable footprints of my neuropathologic work during the past half century at Montefiore.

THE JAPANESE SOCIETY OF NEUROPATHOLOGY

The Japanese Society of Neuropathology was born in 1960 and has grown to become one of the world's outstanding neuropathology societies. Many of our Japanese visiting fellows have played an admirably active role in this wonderful development. In fact, approximately two thirds of these doctors became professors of neuropathology, neurology, neurosurgery, psychiatry, pathology, and other fields of neuroscience. It was a really exciting event when Dr Zimmerman received the Order of Sacred Treasure in 1973, the first such award given to a foreign scientist by the Emperor of Japan. Since 1972, I have regularly attended various meetings and given many lectures in Japan. Since 1984, I have also regularly conducted 2 annual neuropathology seminars organized by Montefiore former visiting fellows, that is, the Seminar for Neurosurgeons and the Seminar for Neurologists. More than 2,000 young Japanese doctors have attended these 2 seminars. Visiting Japan to attend these meetings and seminars, to meet our colleagues and friends, and to witness the wonderful development of neuropathology every year has given me some of the most exciting and wonderful memories in my life (Fig. 3). It was a great honor to receive the Order of Rising Sun, Gold Rays with Rosette, from the Government of Japan in 2001. I was grateful to be invited as a guest speaker to commemorate the 50th anniversary of the Japanese Society of Neuropathology in 2009.

With regard to professional memberships, I have been an active member of the AANP (1965–present), president (1977–1978), counselor, representative in the International Society of Neuropathology (1978–1995), and received the Award for Meritorious Contribution to Neuropathology in 1993. I used to present my best work in an article every year at the annual meeting in June. It was a 10-minute presentation that I read with intense nervousness. In 1978, however, our meeting was organized with the VIII International Congress for the first time in the United States at Washington, DC, under the then president, Dr Kenneth M. Earle (Fig. 4). Because I was the president of AANP, I presented an article entitled “Neuronal and Glial Cell Processes in Neuropathology” at the presidential symposium. It was my first experience to give a 1-hour talk without reading from a manuscript. To offset my Japanese English, I used many EM pictures and illustrated the key points by drawing a picture on a blackboard. An hour flashed by in a moment, and I was shocked by the standing ovation of all who attended. This presentation was truly an exciting event in my career. In addition to the AANP, I have served in more than 20 national and international scientific societies, and I am currently an honorary member of the International Society of Neuropathologists, the American Neurological Association, the Japanese Society of Neuropathology, and the Japanese Society of Neurology. I have been listed in the Marquis Who’s Who in America since 1986.


In addition to the awards previously mentioned, I have received a great many honors and awards from various universities and medical societies in the world. These include Billings Silver Medal from AMA (1959), Henry Moses Research Award from Montefiore Medical Center (1968), Key to Osaka City (1977), Special lecture at the Royal College of the Canadian Association of Neuropathologists Royal College of Physicians and Surgeons of Canada (1980), First Jack Prichard Memorial Lecture, Queen’s University, Belfast (1980), First endowment lecture of neuropathology in memory of Mrs Brajan Bharati and 150th Year Celebration of Madras College (1984), Certificate of Appreciation for a special lecture at the 8th Asian Oceania Congress of Neurology (1991), and numerous certificates and rewards received in Japan. There were some unforgettable historical events that I remember; the Cuban crisis news heard at the opening ceremony of the first Japanese Society of Neurology (October 22, 1962). There was the conflict between Ireland and England when I was in Belfast. On October 31, 1984, immediately after my lecture at Madras College, the dean announced the assassination of the Indian Prime Minister Indira Gandhi, and I had to be driven to the airport in an ambulance car through the empty streets under martial law. I was a visiting professor at the University of Western Australia in 1987, Kansai Medical
Throughout my medical career, I have been very fortunate to meet many great teachers, especially Dr Zimmerman and Dr Terry and also excellent associates in neuropathology. It was my unexpected great pleasure and honor to become the Harry M. Zimmerman Professor of Neuropathology, Montefiore Medical Center in 1995. I have been commuting to Montefiore every day, and I study and discuss neuropathology with young students, residents, fellows, and staff in the department under the large portrait of Dr Zimmerman on the wall in my office.

My wife Keiko was born in Tokyo, graduated from Tokyo Women’s Christian University with an English major, and in 1955, she came to the United States to study American Culture as a scholarship student at Mount Holyoke College, MA. We met at a picnic hosted by Mrs Eleanor Roosevelt, and we were married in New York City in 1959. She has been an invaluable help in my academic career. She was a Japanese teacher and has always been a wonderful mother for our 4 children. Our first son, Michio (Harvard, class of 1982), is now a professor of Neurology and the director of the H. Houston Merritt Clinical Research Center for Muscular Dystrophy and Related Diseases at Columbia University Medical Center. Ikuo, our second son (Yale, class of 1985), is an associate professor of Gastroenterology and Hepatology at Northwestern University in Chicago. Our daughter, Yoko (Williams College, 1990), is an editorial manager of Pearson Education. Our third son, Shigeo (Harvard, 1994), is an assistant professor in the Department of Political Science at Columbia University. We now have 4 grandchildren, and the fifth is expected soon. We meet often (Fig. 5), and in 2009, we celebrated our golden anniversary together at the Mohonk Mountain House, a historical hotel in the Catskill Mountains.

Most young doctors and students do not know me, but some of them know of the Hirano body. Some years ago, a student came to me after my talk at a conference at Einstein Medical College. He looked at my tie and said, “This is an EM picture of the Hirano body.” I answered, “Yes, but how do you know?” He said, “I saw a similar picture at a neuropathology course just the other day.” I told him that this tie was designed by one of my former students and was made at a silk factory in Kyoto. Then he asked, “What is your name?” I said, “Hirano.” He immediately responded, “I don’t believe it!” “Why?” I asked. Then he said, “I know of many bodies in neuropathology, such as the Pick body, the Lewy body, the Negri body. These are all coined names—but none of the doctors is alive today!”

ACKNOWLEDGMENTS

This article is modified from Hirano A. Memorial lecture: Studies of neuropathology over the last half century. Neuropathology 29, Supplement, June 2009, pp 233–239. Permission to reprint part of the article to The Journal of Neuropathology and Experimental Neurology is granted by Dr Kiyomitsu Oyanagi, the president of the 50th Annual Meeting of the Japanese Society of Neuropathology.