Two Essays from *Mathematicians Who Lost Their Faces*

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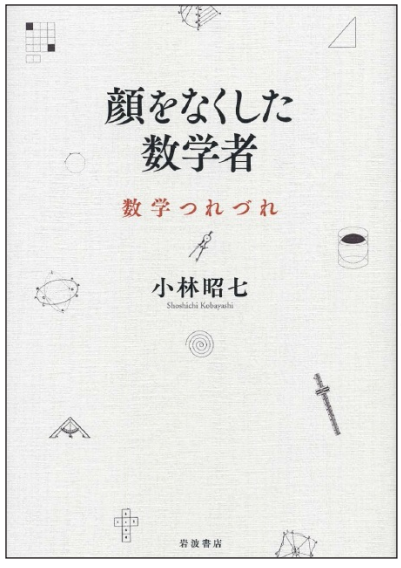
The following is an English translation of two articles selected from Shoshichi Kobayashi's essay book *Mathematicians Who Lost Their Faces: Essays in Idleness on Mathematics* [1] published (by Iwanami Shoten Publishers, Tokyo, Japan) in Japanese posthumously in July 2013. The complete table of contents can be found on his memorial website, along with an English translation of four additional articles.[1]

President Lincoln and Euclid[2]

The reason why Greek mathematics distinguished itself from the mathematics of the Egyptians, Babylonians, and other ancient civilizations is found in its philosophy that by starting from several principles, definitions, and axioms, it clearly stated a proposition and rigorously proved it. They allowed no compromise and proved a series of propositions by going through step by step, starting from five postulates that could not be reduced any further.

It is really strange that mathematics in which a proposition was proved by a rigorous demonstration was developed only in the Greek civilization. According to Prof. Shuntaro Ito, who studied the history of Greek science, such "demonstrative mathematics" could be formed in the city-state of ancient Greece only because it was a society where every citizen, standing on equal footing, expressed his/her opinion and, when asked for its basis, persuaded others by explaining it logically. It would have been difficult under an autocratic regime which produced a cultural climate in which even knowledge was given from its authority and was inherited as a tradition without questioning "why?" (cf. Shuntaro Ito, *Mathematics of the Greeks*, Kodan-sha Gakujutsu-bunko, 1990).



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Mr. Ito's explanation has something in common with the following anecdote about Abraham Lincoln. Even primary school children know the story about Lincoln that he was born in a log cabin in the countryside of Kentucky, barely attended even a primary school, raised by parents who could not read, yet he taught himself to become a lawyer, jumped into the world of politics and became the sixteenth American president, and achieved the emancipation of slaves.

It is less known, however, that when he ran for president, he stated in his résumé that he "studied the first six volumes of Euclid's '*Elements*'" (cf. Salomon Bochner, *Role of Mathematics in the Rise of Science*, Princeton University Press, 1966; translated into Japanese by Tamotsu Murata, Misuzu Shobo Publisher, 1970). When Lincoln was asked why he studied Euclid, his answer was, "A lawyer is always asked to 'demonstrate' (i.e., to prove by reasoning or evidence). I thought therefore that in order to learn what 'demonstration' is, studying Euclid's *Elements* should be the best."

In order to win in a court case, a lawyer must convince the judge and jurors by demonstrating his claim in a systematic manner. This seems very similar to Professor Ito's theory about the mathematics of ancient Greece. (Incidentally, Q.E.D. stated at the end, when proving a proposition, is an acronym for the Latin phrase "quod erat demonstrandum," i.e., "which had to be

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[1] www.shoshichikobayashi.com/recent-publications/

[2] [1], *pp. 65–67.*

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demonstrated," where "to demonstrate" here means "to prove.")

As Mr. Ito used the expression "without making any compromise or concession" in characterizing Greek mathematics, we feel about Greek mathematics something more than its emphasis on demonstration. I recall that the poet Ms. Chimako Tada (1930–2003) wrote a long time ago in a journal, probably in *Bungei-shunju,* something like "The reason why we are attracted to ancient Greece is because we are attracted to the youthfulness of its civilization. The fact that their period was ancient means that they were young as a human race. We are four thousand years older than the human race of 2000 BC." In fact, the characteristic described as "without making any compromise or concession" is an indication of youthfulness.

Just like poets find the youthfulness in Homer's poems, mathematicians feel the youthfulness of the Greek civilization in the mathematics of the Greeks.

Mathematicians and Politicians[3]

Ms. Margaret Thatcher (1925–2013), who was the prime minister of the United Kingdom, graduated from the Department of Chemistry, the University of Oxford. The current chancellor of Germany, Ms. Angela Merkel (1954–), studied physics at Leipzig University from 1973 till 1978 and obtained her Ph.D. in physics in 1990 from Berlin. She published several articles besides her doctoral thesis on quantum chemistry.

In France, there was Joseph Fourier (1768–1830), a mathematician who participated in politics. He was involved in many political movements but was primarily on the side of Napoleon, and was appointed to "Prefect" (a governor-like position) of the Isère Department (in Grenoble).

Pierre-Simon Laplace (1749–1827, celestial mechanics) was also appointed by Napoleon to be Minister of the Interior, but it did not last six months.

Émile Borel (1871–1956, measure theory, probability theory) became very active in his later years as a member of the National Assembly in 1924–1936, as the Minister of Marine in 1925 (in the cabinet of fellow mathematician Paul Painlevé), and as a member of the French Resistance during World War II.

Paul Painlevé (1863–1933, nonlinear second-order differential equations) served two terms as prime minister, both of which were short-lived (September 12–November 13, 1917, and April 17–November 22, 1925) in the unstable period of the French Third Republic (1870–1940), which included World War I (1914–1918), when the cabinets were formed and fell one after another. He also served as Minister of War and Minister of Education for many years around the period of World War I.

[3][1], *pp. 121–122.*

The former president of Peru, Alberto Fujimori (1938–) earned his master's degree in mathematics from the University of Wisconsin in Milwaukee.

Let us turn our attention to Japan. Dairoku Kikuchi (1855–1917) went to study in England at the age of eleven in 1866 under the order of the Tokugawa shogunate and received a bachelor's degree in mathematics-physics from St. John's College of the University of Cambridge at age fifteen. After returning to Japan, he later became the president of Tokyo Imperial University and then served as the Minister of Education in 1901–1903.

But among the Japanese mathematicians, one who became a full-fledged politician is a former governor of Hiroshima City, Tadatoshi Akiba (1942–). After receiving his bachelor's and master's degrees in mathematics from the University of Tokyo in 1966 and 1968, respectively, he went to the Massachusetts Institute of Technology (MIT) and received his Ph.D. under the guidance of John Milnor. His specialty is topology. After teaching at the State University of New York at Stony Brook for two years, he taught at Tufts University in Massachusetts from 1972 to 1986 and returned to Japan in 1986. After teaching at Hiroshima Shudo University from 1986 to 1987, he ran for member of the House of Representatives from the Social Democratic Party in 1990 and won the election and served as a member of the House of Representatives until 1999. From 1999 till 2011 he served as the mayor of Hiroshima, indeed for twelve years. He adhered to his position for the total abolition of nuclear weapons as a member of the Social Democratic Party and as mayor of Hiroshima. He must have seriously carried out the administration of the city, judging from the fact that he lasted as long as twelve years. [Incomplete][4]

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Reference

[1] Shoshichi Kobayashi, *Mathematicians Who Lost Their Faces: Essays on Mathematics in Idleness (in Japanese)*, Iwanami Shoten Publisher, Tokyo, July 30, 2013.

[4]*This article was not part of the initial manuscript that Shochichi sent to the editor in April 2012. The rough manuscripts of this article and another article, "Mathematical education," were found in his house at Berkeley in the spring of 2013, several months after his death.*