

(Ms. Misuzu Tamaru : Anchor Newscaster)

Next is Today's Feature. In October last year, we aired a special report about a professor's punitive dismissal by the University of Tsukuba, which had alleged that the professor falsified data to write a scientific paper. Do you remember? The ex-professor filed a lawsuit against the University of Tsukuba, denying any misconduct. Last April, the local court gave a ruling about the case. What was the decision about the misconduct?



Today the ruling is going to be given.

In the morning;

(Reporter)

“Did you sleep well last night?”

(Dr. Teruji Cho)

“Yes. I did sleep just as usual.”

Dr. Teruji Cho, former professor of the University of Tsukuba, was confident of winning the suit as he headed toward the courtroom with his lawyers. Next came the defense lawyers for the University.

This lawsuit was filed in October 2008 by Dr. Cho in order to restore his position as professor of the University of Tsukuba. The University had punitively dismissed Dr. Cho, alleging that they had found out data falsification in the scientific paper published by Dr. Cho, who was then the Director of the Plasma Research Center of the University. According to the University, data falsification was found in the investigation the University conducted in response to an accusation made by a student.

(Dr. Teruji Cho)

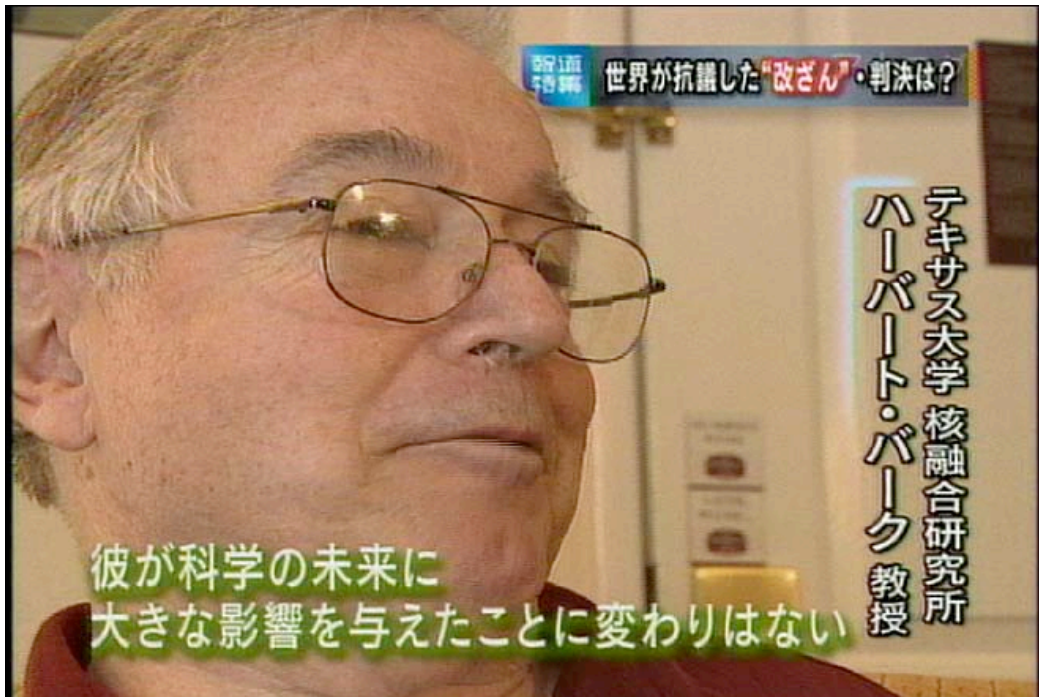
“I really don’t understand what’s wrong and what on earth has caused all this. So mysterious!”

Plasma consists of charged particles. Lightning and aurora are good examples. As a matter of fact, the sun is not solid, but consists of gaseous plasma. A lot of nations in the world are investing huge amounts of money in plasma research, with the aim to artificially generate energy similar to the sun, in order to utilize it as a novel energy source for the future to replace soon-to-be depleted fossil fuels such as oil and coal.

As the temperature of plasma reaches up to 100 million degrees, it induces violent turbulence due to the extraordinary temperature difference between inside and outside of the experimental apparatus. A key challenge for the plasma research is how to suppress this turbulence.

Dr. Cho wrote a paper claiming that he had successfully suppressed this turbulence by overheating electrons. His paper was published by Physical Review Letters, one of the most authoritative scientific journals in the field of physics.

Prof. Herbert Berk of the University of Texas, who then was responsible as a main member of the Editorial Board for the review of papers for the journal, says, “Even if Dr. Cho should lose in the lawsuit, it would give no damage to the great influence he had exerted on the future of science. His paper had shown a discovery of a pioneering nature in the field, although it was not mentioned in the investigative report



by the University.”

Regardless, the University of Tsukuba demanded Dr. Cho withdraw his paper, claiming that two figures used in the paper were based on falsified data.

(Dr. Teruji Cho)

“Research papers are the soul of researchers. To tell a researcher to withdraw his paper is nothing less than to tell him to die.”

Hearing this, scientists of the world strongly objected.

《 Scientists Protest Professor’s Dismissal 》

Prof. Berk in the United States, along with other researchers in Russia, Sweden, Ukraine, Germany, and Japan; all of them are world-famous researchers in the field of plasma research, flatly negated the suspicion of falsification, and their protest statement with their signatures was carried in a scientific journal.

(Prof. Nathaniel Fisch of Princeton University)

“Punitive dismissal deprives the scientist of the research opportunity. It is equivalent to a death sentence to a researcher who has devoted his life to science. If the court doubts a scientific paper in the same way as the University, it really is a folly.”



Were the data falsified?

Can it be the ground for dismissal? The decision was made.

“The court decides that the claim made by the plaintiff is to be dismissed.”

The court acknowledged the University of Tsukuba’s argument that there was data falsification, negating the plea by Dr. Cho, who claimed that the dismissal was invalid. The University of Tsukuba released a comment saying that the decision was quite reasonable.

(Dr. Teruji Cho)

“Why?”

An unbelievable and unexpected decision for Dr. Cho.

(Teruji Cho)

“Top researchers in the world have appealed (against the University’s action). I was very surprised that the decision ignored their appeal. The University’s statements were created by people who were not experts. But this decision by the court seems to have been written according to their views.”

This statement, written by a professor of physics with Tsukuba University was referred a lot in the decision. His area of specialty is not plasma. The red stickers show the part of the testimonies of Dr. Cho’s former student. His testimonies accusing misconduct are referred to many times in the statement.

This is the chart regarded as the evidence of the instruction to falsify the data.

There are handwritten notes by Dr. Cho, such as “Toru (remove)” the three points which are off the theoretical curve.

(Student X)

He told, “These three points seem to be positioned rather higher than others. Dr. Cho decided to erase them because they look odd to anybody who would see them.”

The University determined that Dr. Cho's instruction was " a perfect fraud," as "He erased the inconvenient parts without any reason and the analysis was unjust."

We (TBS) asked third-party scientists to review the controversial note. Both scientists are specialized in this area.

(Prof. Hideki Maezawa, High Energy Accelerator Research Organization [KEK])

"They only accepted the student's opinion and did not include any professional judgment. Had there been even a little bit of professional review similar to the one we did here, the results would have been different."

(Assoc. Prof. Tsuneharu Koide, High Energy Accelerator Research Organization)

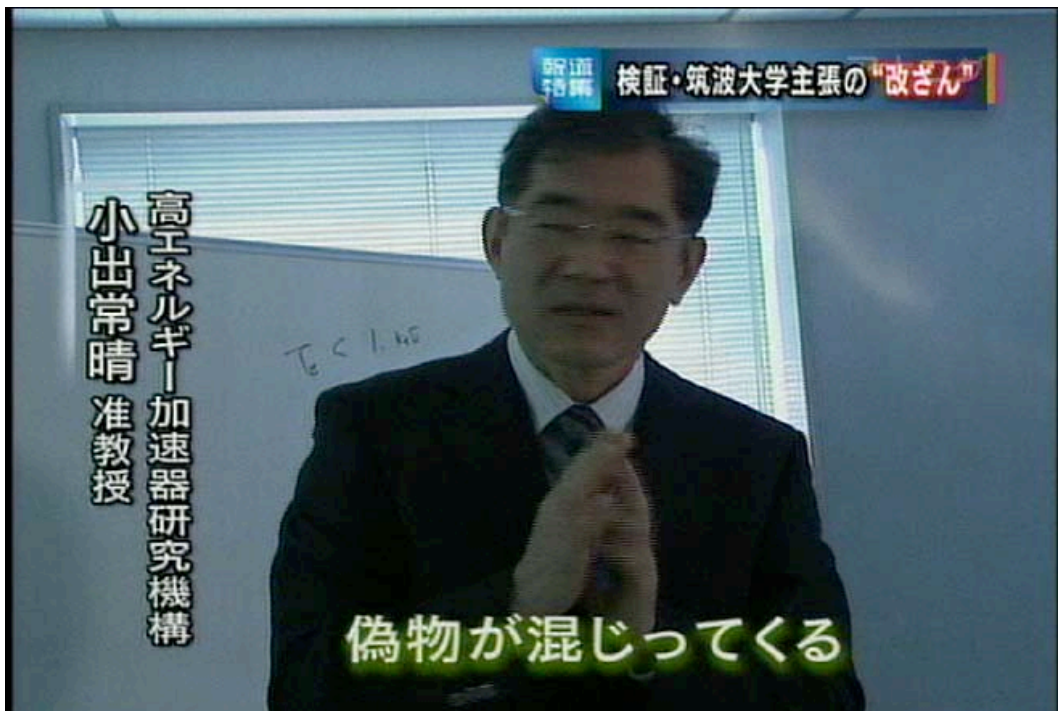
"Well, I agree."

They say the note is not anything like a falsification instruction.

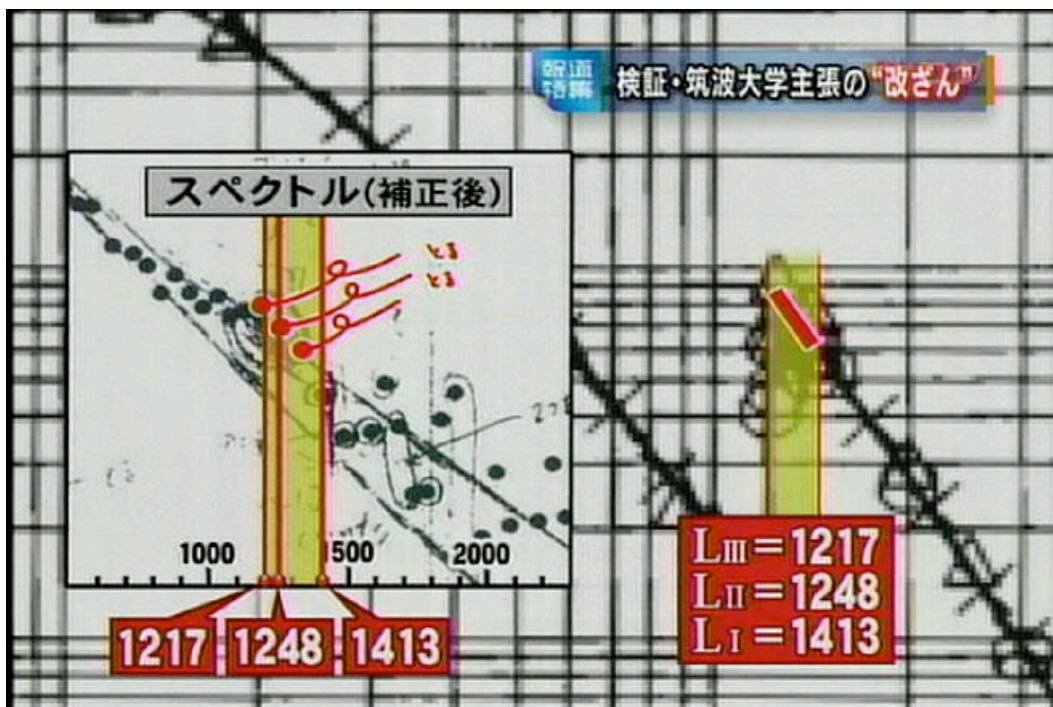
Anyway, this graph shows the measurement results of x-ray released from plasma. They say that germanium used in a detector usually overreacts to x-ray and sends false signals.

(Prof. Tsuneharu Koide)

"We have to be very careful when we measure something using a detector, because, there is an inevitable opportunity to catch false signals that could be mixed in."



This is the point where germanium overreacts to X-ray. The instruction to remove these dots was intended to remove the part where germanium in the detector overreacted.

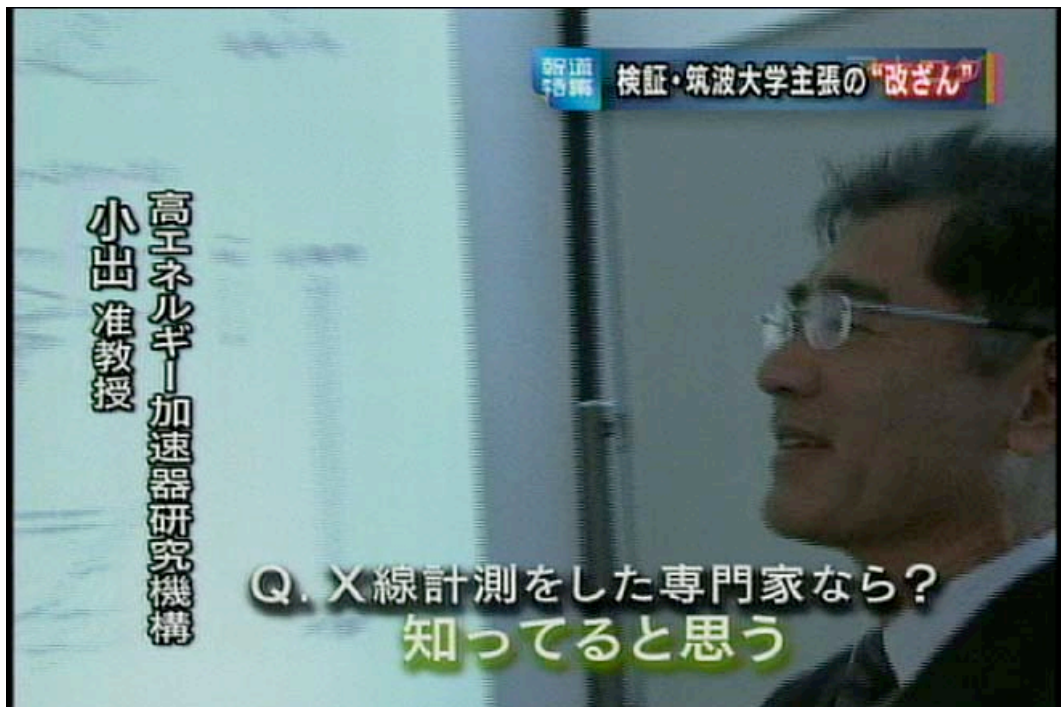


(Reporter)

“Is this a common knowledge for specialists who have experience in x-ray measurement?”

(Prof. Tsuneharu Koide)

“I think so.”



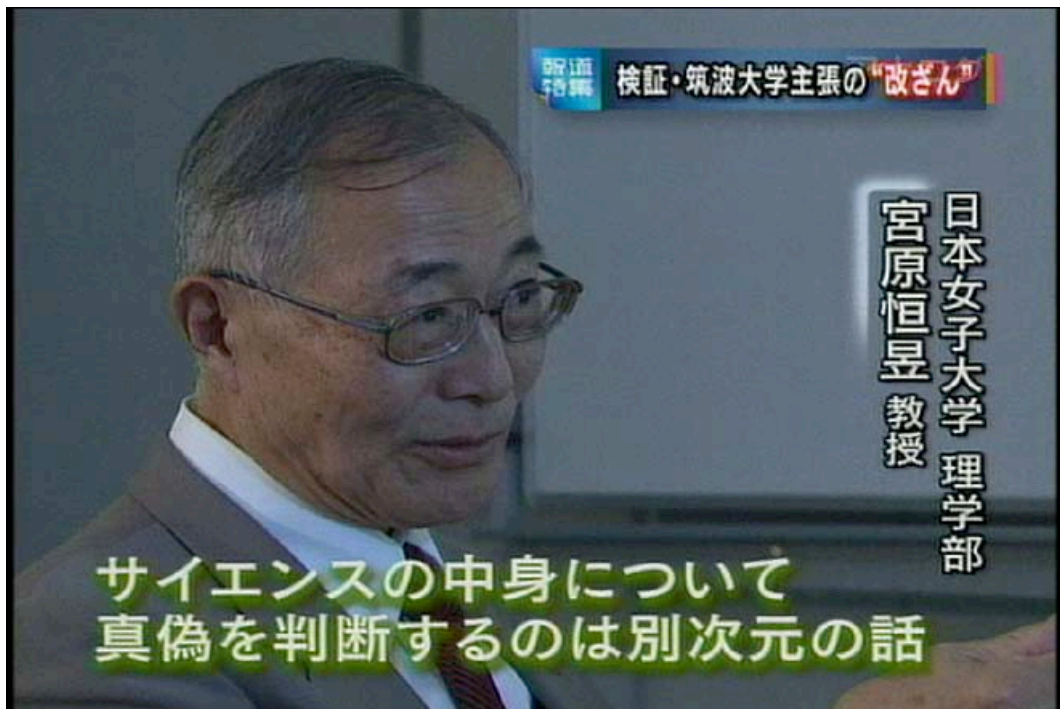
(Prof. Maezawa)

“I think that his instruction to remove them meant to teach students having no experience to consider such factors as well.”

(Professor Tsuneaki Miyahara, Faculty of Science, Japan Women’s University)

“I understand that in general there is a need to protect a person without power since the

people who teach have power and the people who are taught don't have power. However, to determine what is right about science is a different story.”



Why did the student begin to think this was a wrong instruction? The student's testimony continues.

(Student X)

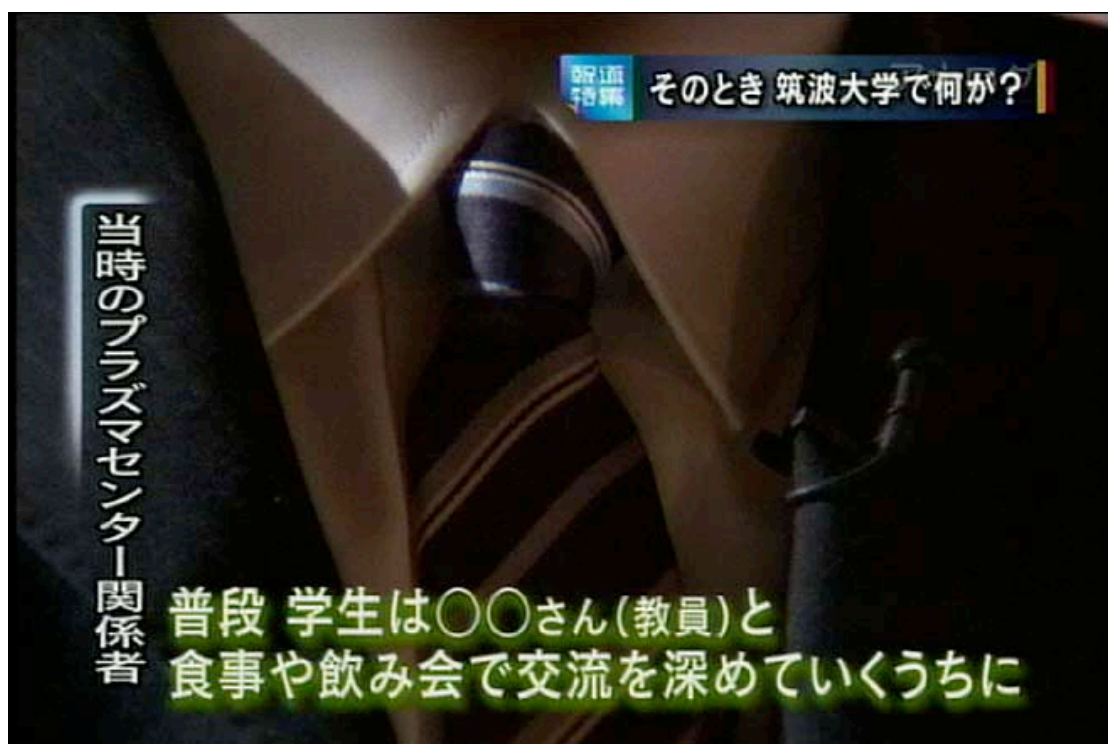
“I didn't think that was wrong. But I was told by my seniors that it seemed to be wrong.”

At that time, there was a rumor that the data used in Professor Cho's research was not right among the students of Tsukuba University's Plasma Research Center. A person who knows well what was going on at the Research Center in those days explained how such a rumor started.

(A person who was familiar with Plasma Research Center at that time)

“While students got closer to Mr. or Ms. X (a faculty member) by eating and drinking together, they were told that the data itself might have been wrong. So the people who didn’t understand well just believed that and most of the students got affected.”

There were faculty members in Plasma Research Center who told the students that the data was wrong.



Students increasingly began to have strong fear and frustration that they were forced to be involved in false data analysis.

Dr. Cho said that Tsukuba University did not conduct thorough scientific investigation regarding the accusation of falsification.

(Dr. Teruji Cho)

“If a person does not understand this, we can’t call him or her a professional in x-ray measurement. This really is a very basic level.”



Professor Akira Hasegawa, who succeeded in deriving an equation about turbulent flow of plasma and its stability for the first time in the world, has been awarded the Order of the Sacred Treasure this spring for his great contribution to plasma research development. He said,

(Akira Hasegawa, Honorary Professor, Osaka University)

“Plasma probably is something most complicated in its behavior and most difficult to

diagnose in the field of physics. As I said, we can't get a very clean data because it is in turbulent state and in an extremely high temperature range. That should be the first thing to be understood by people in other fields before they say anything about it.”



At the time of the investigation by Tsukuba University, prior to getting dismissed, Dr. Cho submitted a document explaining his own analysis in more commonly used methods, so that non-specialists of data analysis would better understand. Meanwhile, he submitted a paper (showing the same analysis) to a science journal to invite professional judgment from the researchers in the world.

(Herbert L. Berk, Professor, The Institute for Fusion Studies, University of Texas)

“We seldom see a science paper with this level of transparency as it shows all the raw data. Investigation to judge if there was any falsification of data analysis should be performed by third-party scientists without any bias by examining the data to find if they could get the same conclusion.”

However, Dr. Cho did not invite any third-party scientist as a witness for the trial. He believed that the fact that his paper describing his own analysis was published on the science paper after strict reviews should have been the best evidence.



(Dr. Teruji Cho)

“Well, it would be extremely difficult to submit an evidence that could explain more than a scientific paper. Of course, it would be an option to invite a witness for the trial. However, if asked to compare that with the American Physical Society, we would have to consider that APS should have more authority as they have five referees.”



In order for the court to determine if there was falsification by hearing opposing arguments from both sides, it is required to have professional knowledge and understanding about difficult matters. For example, it is common to get a third-party expert witness to state their professional views in medical malpractice cases, and a system to recommend an expert witness has been established in the Supreme Court.

(Mr. Mitsuru Miyata)

“In Japan, there is almost nobody who has experience in managing investigations of research malpractice because they started to become issues since around 2005. As a result, it is a little embarrassing but groups of amateurs are involved in judgment of research malpractice.”

Science Council of Japan has recommended establishment of a third-party organization to investigate alleged research malpractice; because, these cases often are arising from conflicts of interest between the accuser and the accused.

(Mr. Mitsuru Miyata)

“If we continue to punish one person as a warning to other, scientific research will be devitalized. We have to provide an environment for scientists to perform creative researches without any worry, so that people’s trust in science would not be lost. I think it is urgently needed for us to establish a third-party organization for that purpose.”

Then, if third-party experts examine the same data as this case, will they be able to get the same conclusion as Dr. Cho? Professor Tsuneaki Miyahara of Japan Women’s University, Professor Hideki Maezawa of High Energy Accelerator Research Organization, and others agreed to examine the data.

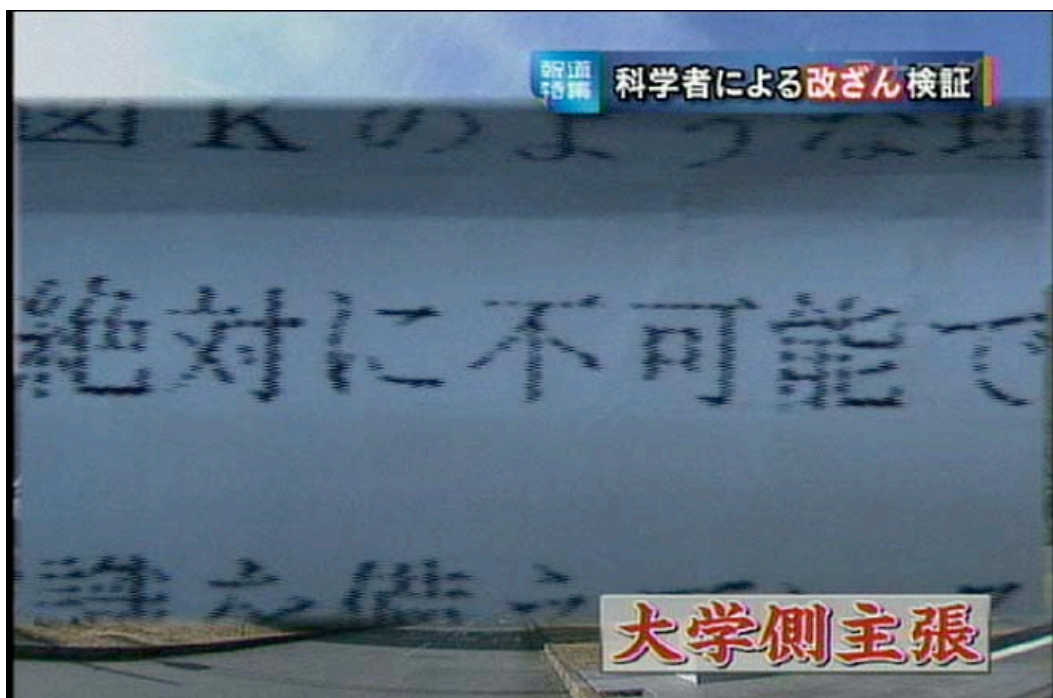
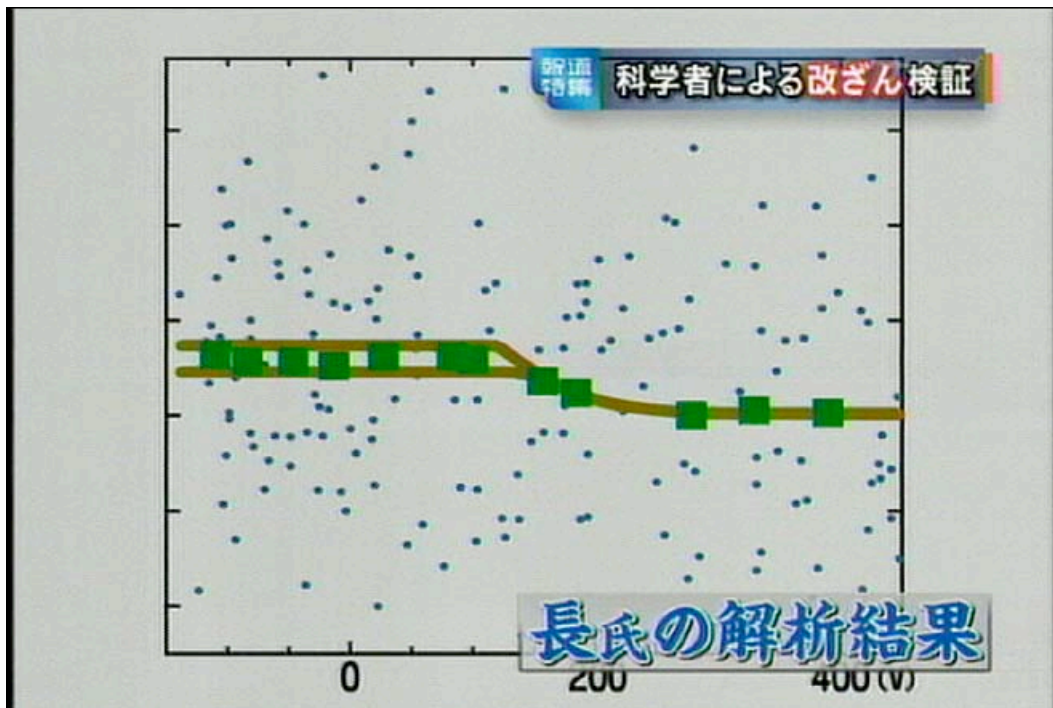


(Professor Hideki Maezawa, High Energy Accelerator Research Organization)

“Almost everyone thinks, “It has nothing to do with me, it’s none of my business.” However, if we leave this case as it is, we won’t be able to justify ourselves when we are told that we perpetrated misconduct in research.”

These are the data they reexamined. This is a model curve that shows how this seemingly random data changes if turbulent flows in plasma get stabilized. Dr. Cho pointed out that they could get the same curve as the model curve by taking the median values of vertically scattered dots.

The University argued that these data are totally random and meaningless and that it is absolutely impossible to draw a curve by averaging the dots.



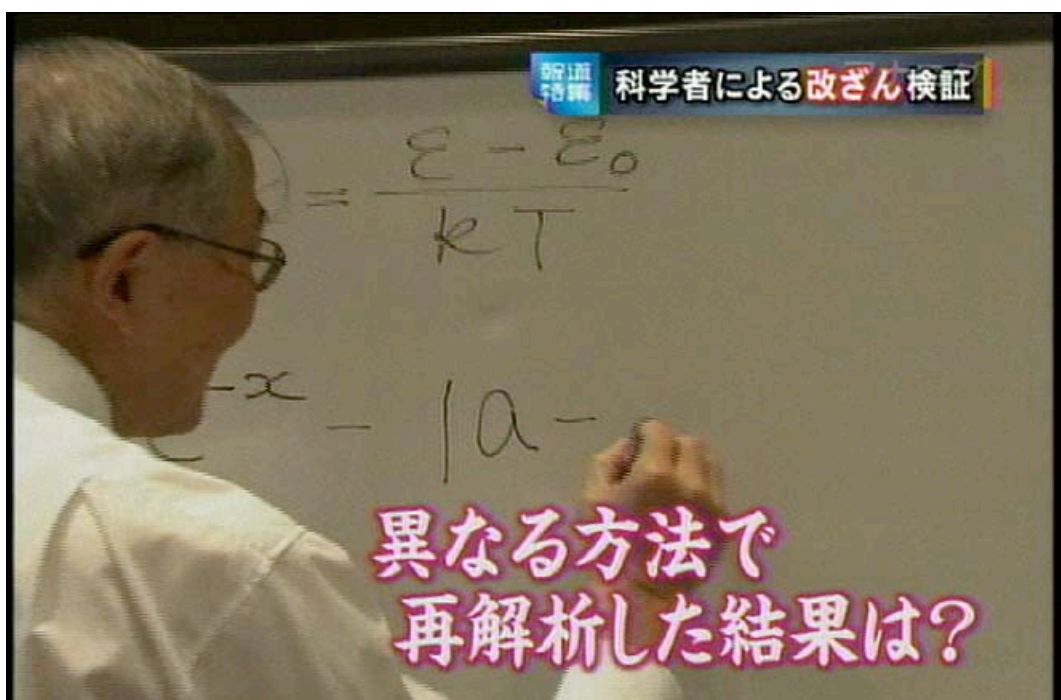
(Prof. Maezawa)

“The University claims that drawing any sort of conclusion from this data set is already unjust and equal to falsification. When we see this sort of data, our common sense tells us to do this; compress the horizontal axis.”

As you can see, now the centers of points at right and left ends are at different heights.

(Prof. Maezawa)

“This operation reveals that the shape of the mathematical function on the right is hidden in the graph. If you understand the principle, then you can see this.”



The two experts in the field started to reanalyze the same data intentionally using different methods. What was the result?

The result of the analysis showed that the graphs they derived were practically identical to Dr. Cho's, and that they obtained the same results within scientifically permissible error range.



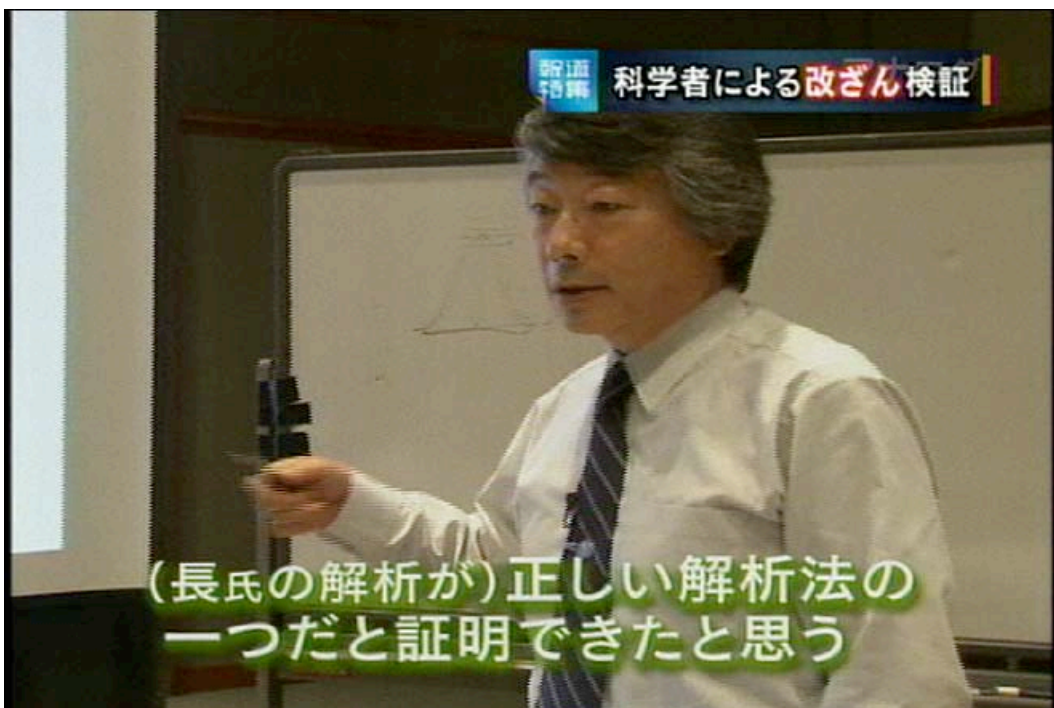
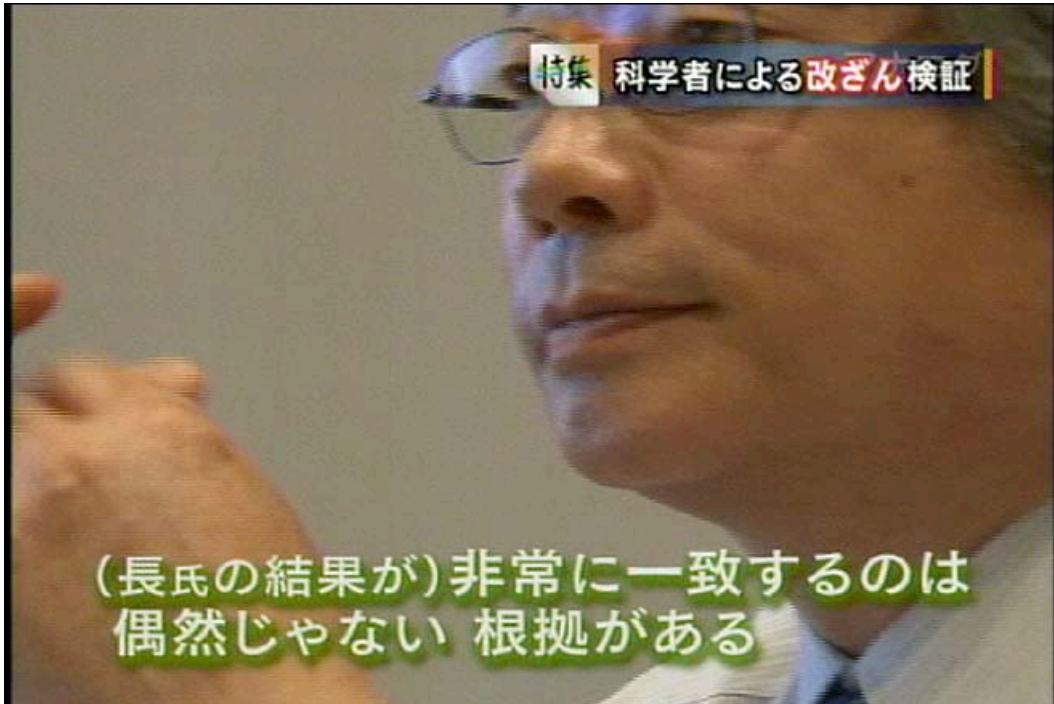
(Prof. Miyahara, Faculty of Science, Japan Women's University)

"It is not a coincidence. It is not by accident that Professor Maehara and I arrived at essentially the same conclusion by using different analytical methods. There is undeniable reason behind it."

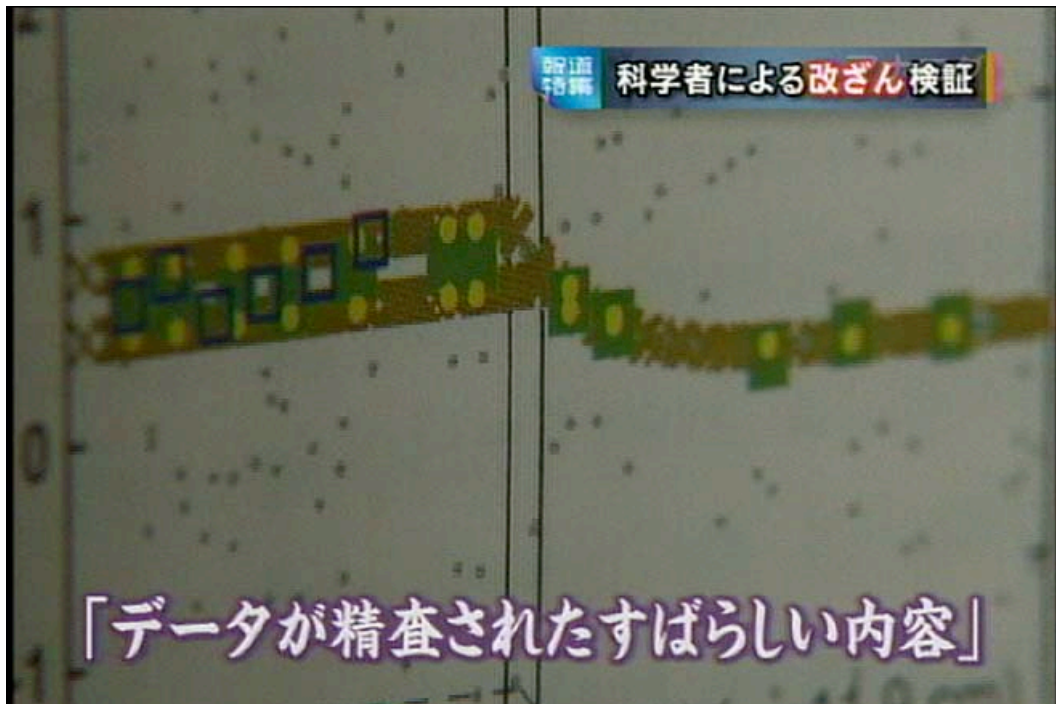


(Prof. Maezawa)

“Now it is proven that the original data has significance and is meaningful. It was not totally random, meaningless data. We believe that it (the analysis Dr. Cho performed) has been proven to be one of the correct analysis methods.”



The controversial figure and analysis method were published in *Physics of Plasmas* and the paper garnered high praise as an excellent paper with extremely carefully performed data analysis.



However, the court judged that there is no objective evidence that the analytical method Dr. Cho used was widely recognized to be scientifically correct and appropriate.

(Prof. Maezawa)

“Of course, there isn’t any objective evidence that any particular data analysis method is

correct. There can't be.”

(Prof. Koide) “It is almost impossible that any method is absolutely correct.”

(Prof. Miyahara) “Yes, yes, yes.”

(Prof. Maezawa)

“There are fields where standardization of analytical methodology is attempted. However, these are limited to very mature fields, really.”

(Prof. Miyahara)

“Yes, very mature fields only.”



Then they harshly criticized Tsukuba University's claim that Dr. Cho's data analysis was arbitrary and improper.

(Reporter)

“They are criticizing that an arbitrary analysis had been performed, so that the result ‘fits’ the theoretical curve, aren't they?”

(Prof. Maezawa)

“If you say that, it will lead to a total denial of science itself. Nobody starts experiments without predicted models nor theoretical curves.”



(Prof. Miyahara)

“Agree. It is impossible to analyze without it.”

(Prof. Koide)

“It is utterly impossible. It is not science”.

(Prof. Maezawa)

“A university is an organization made up with researchers, isn’t it?”

(Prof. Miyahara) “Certainly”

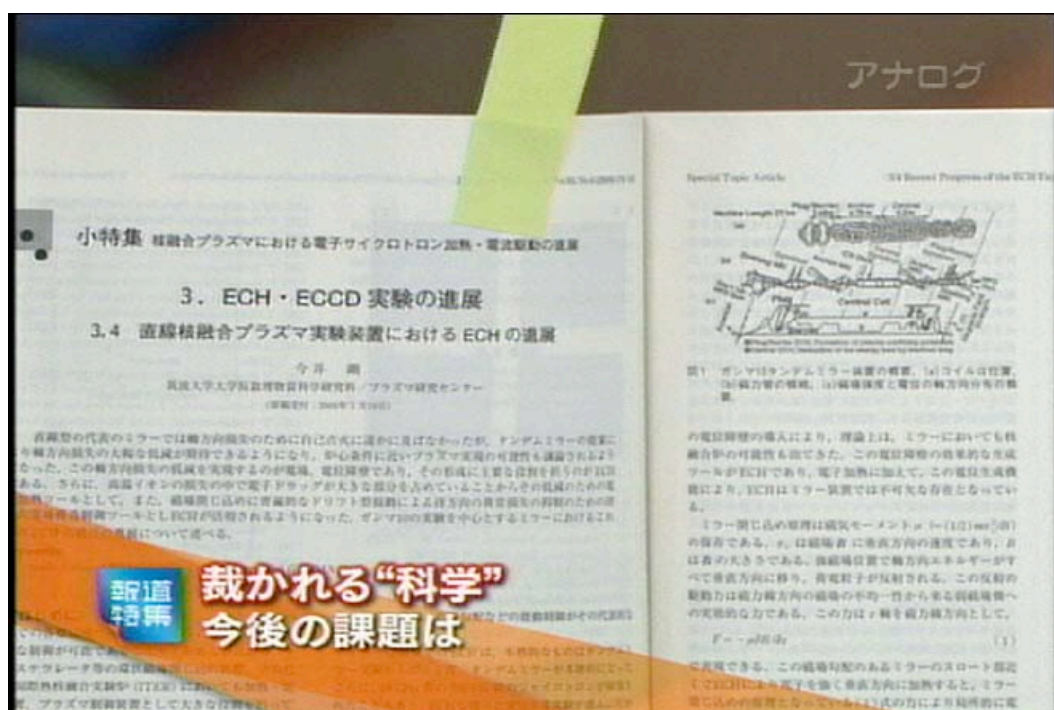
(Prof. Maezawa) “They are saying something totally incredible.”

TBS has repeatedly requested Tsukuba University for an interview since last year. However, the University has consistently refused, saying “The trial is still going on. It is very likely that either party will appeal, and the trial will continue in higher courts.”

Science itself is being tried. Dissatisfied with the decision, Dr. Cho appealed. The trial will start once again at Tokyo High Court on July 12.

(Ms. T. Kubota: Assistant newscaster)

“This official journal of a scientific society carries a paper authored by the successor of Dr. Cho at the Plasma Research Center of Tsukuba University. This paper used the very data ridiculed by the University to be totally random and meaningless, but the University did not question this paper at all.”



(Ms. M. Tamaru: Anchor newscaster)

“That is really strange. For your information, the number of lawsuits related to research misconduct has increased rapidly during the past several years. It is of course totally unacceptable if there is misconduct in the research subjects and activities where our taxpayers’ money is used.

However, I believe it is a very difficult task to judge whether there has been misconduct particularly in this sort of extremely specialized and leading-edge fields. As Mr. Miyata,

editor of Nikkei BP, pointed out in the video, the opinion of unbiased third party scientists should be weighed more heavily in the court proceedings. He feared that, if this change is not made, a challenging spirit in research might be lost in the leading-edge fields where methodology is not yet established.

The time may have come when Japan, heavily reliant on techno-scientific advancement, should have a serious discussion as to how we can judge research misconduct.

This concludes today's feature program."

