

NOTE

“The Storage Ring Experiments
in the United States (Part III)”

Hiizu Fujita

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§1 Fly Blind Across The Pacific

Dr. Masami Ohnuki dropped me a line on January 16, 1966. I received the mail at ISSP, Tokyo. There were three sheets of papers in the envelope : one was written in Japanese and the rest of the two were copies of the letters written in English. In the Japanese letter, Dr. Ohnuki said he had sent back the recommendation letter to Professor Fred Brown, in U. I. Professor Frederick C. Brown's letter is as following :

February 7, 1966

Dear Dr. Onuki :

I am writing concerning Dr. Hiizu Fujita who has given your name as a reference. Dr. Fujita is applying for a post-doctoral research appointment at the University of Illinois and we need your comments by way of support. As you may know, funds for research appointments are becoming somewhat scarce, and we are trying to find the most promising people. I am looking for an especially capable experimentalist with imagination and a sound background in physics. Your comments on Dr. Fujita will be most appreciated.

Very sincerely,

Frederick C. Brown

Dr. Ohnuki replied ;

February 14, 1966

Dear Prof. Brown ;

I am pleased to have a chance to recommend Dr. Fujita as a member of post-doctoral research in your laboratory.

He was engaged in electronic transport in liquids in his doctoral course of the Tokyo University from 1959 to 1962. Since he joined to the Institute

for Solid State Physics in 1962, his interest has been concentrated to transport phenomena in crystalline solids such as ionic crystals. Through my contact with him in these years, I found him a steady and creative experimentalist with a deep and wide background in physics. His recent works on Hall effect and magnetoresistance of CdS have been appreciated very much in our country, where his talents in experiment and analysis played important roles to complete the difficult works. He carries out experiment skillfully and carefully, and analyzes results thoroughly.

I entertain no doubt about his success in research and adaptability for American life, and I consider him an excellent candidate for post-doctoral research member in your laboratory.

Sincerely yours,
Masami Onuki



Fig. 1 Dr. Masami Ohnuki (center) and Hiizu Fujita (myself : at the left corner) : In the Lab. ISSP (Institute for Solid State Physics, Tokyo) in 1966.

Dr. Ohnuki was only age of forty, when he wrote this recommendation. If I recall the periods of my forties, I am very sure to say that I could not write this sort of beautiful letter to recommend a person. This is because, I believe, Dr. Ohnuki was working for a "Company-Research-Institute", and he was responsible for a project as a "group-leader". The average Japanese University Professor of the day was not trained up to this much. Another thing that makes me tremble today is the "conditions" that Fred stated in his letter ; "I am looking for an [especially capable] experimentalist with [imagination and a sound background] in physics". Were it happened today, I am not so sure whether I can be brave enough to across the Pacific. At any rate, I received a letter from Fred in April ;

April 6, 1966

Dear Dr. Fujita :

By now you should have received Professor Almy's letter offering you a Research Assistant Professor appointment beginning in the fall. We hope very much that this is agreeable and that you will join us. The suggested starting date of September 1, 1966 need not be firm. Actually, I will be out of the country at the summer school in Ghent, Belgium, September 6-16, 1966. Classes at the University of Illinois begin toward the end of September. You might prefer to come to the United States October 1 or at some other time in the fall. We will leave this up to you.

We have one or two new experiments going on which might be of interest to you. I am planning to start a program of measuring the optical constants for certain solids, especially the alkali halides, along lines suggested by Jim Phillips in Vol. 18 of "Solid State Physics", (Seitz and Turnbull). This would be done by normal reflectance measurements out to 300 Å using a vacuum monochromator and synchrotron radiation as a source. The latter

would be very high current (1-15 amp), 250 MeV storage ring being built near Madison, Wisconsin. Proper utilization of this facility would give unequalled resolution in the ultra violet and permit comparison with the details of band structure.

We are also starting some cyclotron resonance work at 2mm for photocarriers in the alkali halides. This is being done by Dr. John Hodby who came to us from Oxford this last February. I'm hopeful that we will be able to determine the effective masses in a number of cases.

I am enclosing some forms for University housing if you are at all interested. These units are fairly nice and located on the South campus about a mile from the physics building. They are not as nice nor as convenient as the Student-Staff apartments which are just across from the physics building. If you are interested, fill out the enclosed application and also mention Student-Staff. Of course, there are a number of privately owned apartments in the community which you might investigate upon arrival. They would be typically \$20 or \$30 a month more expensive.

Please don't hesitate to write if you have any questions. We hope very much that you, Mrs. Fujita and your son will join us this coming fall.

Very sincerely,

Frederick C. Brown

I met with Fred and Joan on the run-way of the U of I Champaign Air Port. It was the dusk of September 26, 1966. They were with good smiles, but we Japanese were all completely exhausted. We came from Tokyo to Champaign directly by the non-stop flight; Tokyo-Seattle-Chicago-Champaign. When our "fancy suitcases" came out, Fred was kindly grabbed a grip and carried one to his car. He was, somehow or other, saying "I GOT IT! I GOT IT!" all the way down to the trunk. This is

the first American-Word that I picked up from Fred.

On the way to Champaign from the Air-Port, Fred stopped at a Drive-in Restaurant. The last meals we took were the Airplane Lunch offered soon after Seattle. However, we were so exhausted that we didn't have any appetite. The taste of the "Bean Soup", that delivered on the table, was quite formidable. The taste was taste, but the smell of the soup was something. It stank as if I was sitting in front of a green grocery store or maybe in the midst of soybeans field ! I quickly recalled Dr. Ohnuki's REMARK : "Take a good care of the US meals, Fujita-san ! Otherwise, you would not be able to stay in THAT country, longer than a year ! But, in your case you are going to live with your family, that may save your crisis !" Well, I knew he was a wellbred Kobe-ite, the famous gourmand people, who also have refined taste for SAKE. While I am one of the, what you may call, Eastern-Barbarians, but I accorded with his vote. Fred took steps when I gave up the bowl of soup. He said he would be absent tomorrow morning, so "Why don't you go to Mrs. Wells, in MRL, and get your office key." I opened my pocket notebook and asked him to jot down his phone number. This is the first Fred's manuscript, that I keep in my collection (Fig. 2).

However, the reality appears always beyond the bank of schedule. My son, Ken, got up on the wrong side of the bed next morning. I called Mrs. Brown, and she was so kind to drive to the Carl Clinic Hospital. Dr. Perucca asked the TEMPERATURE of the patient. I said "38.5 degree CENTIGRADE." Dr. Perucca was surprised and said, "Oh, so chilly !". Everything was upside down and in a desperate Chaos !

Fred soon realized, it's hard to communicate with me ! Very often, I cannot answer his question ! In a couple of week, Fred became very unhappy.

1/15/52 209
 Sorry 7-1, 19
 Hitachi 4.30
 Frederick C Brown
 1014 W. Clark
 Champaign
 7-356 - 7320
 9th 7:30 AM
 U.S. 4.1
 { 7-3337
 - 3362
 (9.30)

Fig. 2 The first Fred's manuscript that I've got : which reads "Frederick C. Brown 1014 W, Clark, Champaign (Phone : 356-7320)". The phone number lower is his office phone, 7-333-3362 ; that shows how to get there from the outside of the campus.

Fred may'd thought that I couldn't follow what he said. So he added a message at the end of his qustionary sentence i. e. "This is a question!". Later, he invented more handy "short form" which is to be added next to his ETX (End of Text). This is just to add a word "Question!". The new form was on the air, like this ; "You have this book, don't you?-- Question !" Well, my trouble was not to keep up his words, nor to understand his unique vocabulary. It was "The LOGIC" of the sentence that made me enable to answer.

As a matter of fact, I was forced to practice my English Conversation with GIs in early 1946. My father decided to dwell in the metropolitan area after the end of the World War II. It was so close to the Meiji Memorial Park. There were about 1,000 GIs, lodging near the park ; under the base-

ball stadium, in the 8th Japanese Artillery Barracks and in the Youth Building. They named every thing by their own way ; Nile-Kinnic Stadium, Doolittle Baseball Field, Mudge Hall, and Meiji Hotel. Every night, GIs were vending Ration, Chocolate, Cigaretts, Soap, Chewinggum and Canned-Beer. They rambled along the street in the completely dark "Black Market" of the Meiji Park. These are the "Private Enterprise" to get hold of yen-bill, since common Japanese didn't accept the green bucks. Trouble was the Mudge Hall and Meiji Hotel. GIs were easily confused by the unfamiliar names, and they lost their way to drive to Mudge Hall to dance. They got hold to any Japanese who were passing by to show them the way. I was rather used to listen to the American English, which was quite different from the "Crown English", reigning over the Hi-school. More over, we had rather frequent visitors to Tokyo University. Finally, I borrowed once "The Linguaphone-Tapes", and I thought I didn't see any serious problem to fly across the Pasific.

However, at the very final moment, I found the books titled "Improving your Conversation". The word of "Improving" came to my liking, and I bought the Volume I and II very quickly. The day to take off was in sight, so I read the books hastily. I didn't see any trouble down to Lesson 6, in Vol. II, title of which was "Answering Questions". The Lesson began with "The suggestion one ; Say something immedeately". "OK, I know that", so I thought. The book continued to suggestion three, "Do not say yes without thinking", and again I thought OK I know that. Soon, at the suggestion five, it said "Do not answer yes-no to an alternative question". This is the point at which many of us Japanese staggered. But I cleared all the exam through Hi-school rather easily. So, again I thought I knew that well.

However, in page 107, I found a new questionnaire form, which I have never met before. That is the "tag" quetion. The page 107 reads following ; 36.

The inverted word order may be in a "tag" such as "isn't it, can she, will they" at the end of a statement. A rising intonation in the tag signals request for information.

Example. 1. You've had lunch (→), haven't you (↑) ?

2. You are going (→), aren't you (↑) ?

3. You are not going (→), are you (↑) ?

37. A falling intonation in the tag indicates comment. The speaker is not asking for information ; he is merely making a comment. The other person generally agrees.

Example. 1. It's beautiful day (→), isn't it (↓) ?

2. That's too bad (→), isn't it (↓) ?

3. You're tired (→), aren't you (↓) ?

My trouble was, no example of answering sentence was shown. Later, in the States, I found this was the so common daily usage for Americans. The author of the book, Mr. Vernon Brown, may thought it's so easy to practice that he didn't need to show any example. At any rate, this was the only spot I felt uneasiness all through the books. I saw just a little piece of "Black Cloud" rising on the horizon, but I didn't worry about it seriously. I thought this was just an exceptional usage.

When I began to talk with Fred in his office, I soon realized that the little piece of "Black Cloud on the Horizon" was actually covering all over the sky ! A few days later, heavy rain drops came down with the terrifying ETX ; "Question !" I was completely at a loss, how to answer the "Questions !" "

First of all, I thought this was a sort of [Alternative Question]. For example, "You have the text (→), don't you (↑) ?" sounded like, for me, "Do

you have, or don't you have?" Then, I thought, I cannot use the word [Yes-No]. My trouble was, I didn't know to answer in a "colloquial" way, without using [Yes-NO]; such as [Right!, Agree!, That's correct!, Exactly!, Exactly Precisely!, I doubt it! etc]

Secondly, I felt something strange with this sort of [Alternative Question]. I have "No Choice" at all to the question! If I was asked that "Would you like coffee or tea?", I can have my choice and would say "Coffee please!". However, to be asked "You have the text, don't you?" is a different thing. This is the matter of FACT, and not the matter of CHOICE! "YES, Fred, I have the text. BUT, I cannot say YES!". [See suggestion five!] So, I could not get at the point of the "Question!" at all. Sometimes, I said "I see" so that I should "say something immediately". However, it was very clear from Fred's appearance, that he was very anxious to ask "What do you mean by see?"

Thirdly, Prof. Fred Brown appeared to ignore what Mr. Vernon Brown wrote in his book. "Fred" Brown said, very frequently, I believe, "You have the text (\rightarrow), don't you (\downarrow)? -Question!" The book said; "A falling intonation in the tag indicates comment. The speaker is not asking for information; he is merely making a comment. The other person generally agrees." And now that I didn't know how to agree with Fred, I decided "Not to Disagree with Fred."; another words, I kept Silence! They say "Silence gives consent!", don't they (\downarrow)?

But, the situation got worse! Fred said once openly, "I am very disappointed by Hiizu's ignoring my question!" He appeared I would be able to understand if he would switch to the classical English. Fred began to say "Shall I do that?" with grim face, rather loudly! This expression terrified me much more! Since, I knew quite well, I couldn't say "Yes, you shall do"! ABSOLUTELY NOT! I knew very well this is the most irrational

and dangerous point in the whirlpool of Crown English ! King Richard III said "You shall die !" None of us Japanese would agree to say, even today, that " This is a rational Sentence !"

I didn't know at all, what sort of facilities were there in the basement of MRL. But, there were heavy steel door labeled "Shelter". I thought I should be very careful, so that my head would not be chopped off behind it !

Conclusion ! Fred suggested one day, at last, for me to go to the Wesley Church which were located at the corner of Green-Goodwin. It is actually just diagonal place to the Physics Building (PB). Fred said, Mrs. Anna Kirk would open a conversation class for me once a week in the Church. The research work was not yet busy. I was waiting for the delivery of the gears. So, I joined it happily.

Actually, her class was already started for Dr. Iino, Dept. of Commerce. He came from the Hitotu-Bashi (what they call One-Bridge) University, and he was enjoying the "Person-to-Person lesson". When Dr. Miyake and myself joined her class, Mrs. Anna Kirk, about age of 70, and with beautiful silvergray hair, was delighted and welcome us very much. She was, of course, 150% Christian, and she said with overflowing smile, "Three Doctors came from Orient to my class !"

The cursed spellbound of the "tag-question" was melt into air very quickly ! Thanks to Mrs. Anna Kirk ! Her lesson was divided into three parts. Firstly, we students must read two or three sections of an article, which appeared in an old Readers' Digest. When reading is over, they are designated us as the Home Work, so that we should be able to repeat them from memory, next week ! All right ! The story is just humble matters of the days ! The point is to recognize the American Way of Expressions ; such as, buggy-doctor, buggy-whip, wellbred-ginger-bread-boy, trick-or-treat, horse-trader, etc ! The second part is a kind of "Show and Tell". Mrs.

Anna Kirk had let us have a sheet of full-color print in the previous class. We had to make a "Story" to explain the "Situations of the Picture". OK ! It's my turn ! You may not know, how I'm good at chopping Logic ! Wait until next week !

It was an easy job to frame up a lengthy Bank-Robbery Story in Champaign out of a picture ; which showed only three talking men on the pavement and a curious looking pedestrian. Or, by showing an idle looking Junior-Hi boy, and let him end up as the Chaikowsky-Violin Concours Prizer ! Mrs. Kirk was kept in a big laughter all through the time, and she was almost drop from her chair ! But ! At the exit door, Dr. Miyake whispered : "There's No Violin Section in Chaikowsky Concours, I tell you !" --Dumb Japanese Theorist who can't be free from Minor-Things ! The new trouble for me was, however, the story was so funny that Mrs. Kirk began to ask to Type-It-Up ! She was anxious to read it to her sister at home, and to her Foreign-Wives-Class. Mrs. Kirk said, "I have never heard such a funny story before ! It's incredible, one can make such a story out of the same picture !" OK, OK ! This is because of my hiding hobby of Japanese-Classical-Rakugo (a kind of one-man-stoy-telling-show, which wipes out the Space-Time-Causality forever !) So, I struggled with my Smith-Corona, but at any rate, "To give was happier than to receive !"

The final part was Mrs. Kirk's Free-Talking ! Soon I realized, she knows ten-thousands of vocabulary with beautiful voice and accurate pronunciation. So, I brought my handy Tape-recorder and put her talk on tape. Later in my apartment, I always noticed she was talking much more than I picked up in the Wesley Church. My next pleasure was to get her Manuscript, somehow. I wished to have one and add it to my Treasure-Collection. I imagined how beautiful it could be ! But, the text paper she gave us was, typed carbon. Finally, when I sent a Xmas Card from Japan, I

received her aerogram ! I opened it ! You will see it later in §6 !

§2 The Same Camp and The Powwow

a) Informal Users' Meeting (April 17, 1967)

If I remember correctly, I didn't get any "printed invitation" for the meeting (cf. Fig. 3). Fred said that we should go up to Stoughton someday. He was anxious to bring a Blue-Print (Black-and-White, actually) with him to the meeting. He arranged to make a "Professional Drawing" out of my shabby one (cf. Fig. 4). It was about 2×2 feet square wide, and he ordered to make five sheets. Fred appeared very happy to see them, and he put one on his office wall. He showed it to anyone who dropped in to his office. YEAH ! Fred waited more than six months ("Two Quarteries", if I would pick up a business word), before he could get just a single drawing ! I didn't fool around, I believe, but that was the first tiny output obtained by the sweat of my brow. I gave mine to Professor Takasi Sagawa, when he showed up at my office, 390 V MRL, in November 16, 1967. He was eagerly asked to have one. He brought us valuable suggestions and comments on our project, and I agreed with his deal. Of course I knew that he would not be able to figure out the details of dimensions and/or our small secrets out of it ; the inch system is far much more complicated than a Japanese might imagine.

On the morning of April 16, 1967, Fred and I started Urbana heading to the North by driving Fred's Ford. Fig. 5 shows Fred at The O'Hare Air Port Parking Lot. Then, We flied up to Madison, where I met with Ed Rowe for the first time. Fig. 6 shows Fred and Ed Rowe at the Airport Restaurant. Ed Rowe, also remembered the day very well. Later he wrote me in his letter of July 8, 1988, as you may read in Fig. 7 ; "It seems to me

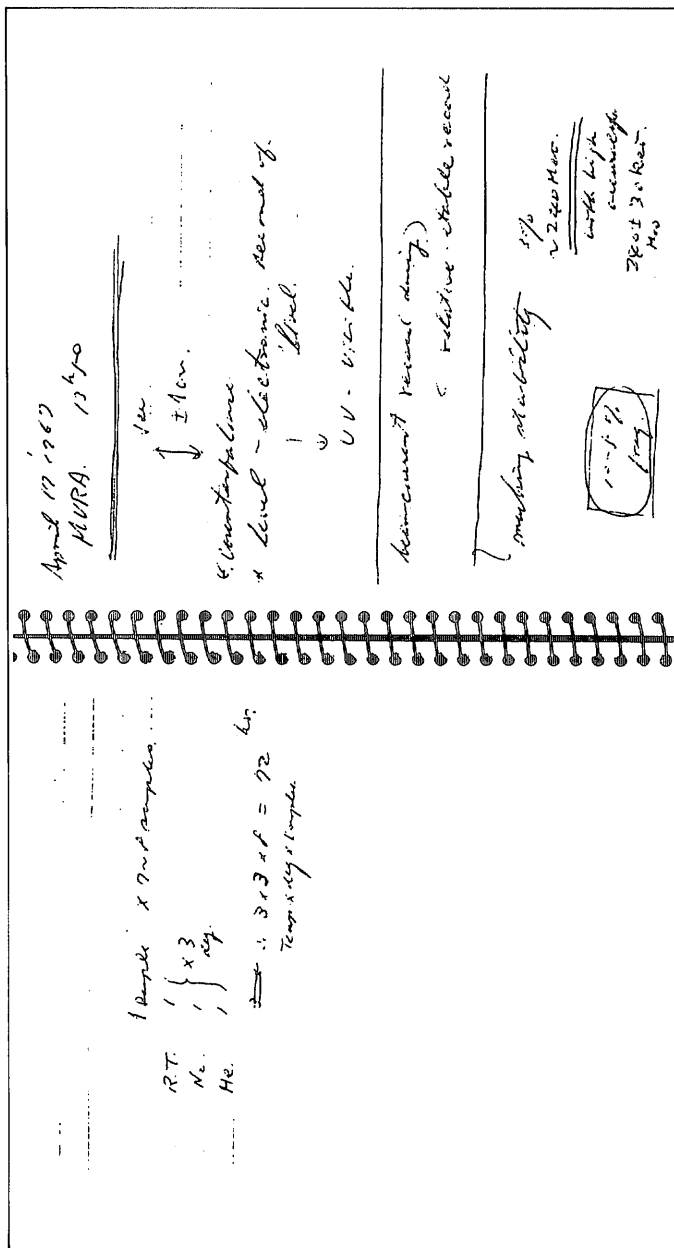


Fig. 3 Note on "The First Users' Meeting", which was held in PSL, (MURA), on April 17, 1967. No "Printed Announcement nor Invitation" was sent to Users, if I remember correctly. On the left page, as you see, the expected "Machine Time for Illinois Group" was figured quickly. It turned out soon, however, very unrealistic; just 72 hours for the first trial! This is the strongest evidence to show how we were all optimistic.



Fig. 4 The assembly blue print for the "Original Equipment". You see how awful it is to construct a machine under the inch-system.



Fig. 5 Fred and I headed to the Chicago O'Hare Air Port, and left his car at the parking lot. It was April 16, 1967, and very windy, of course !

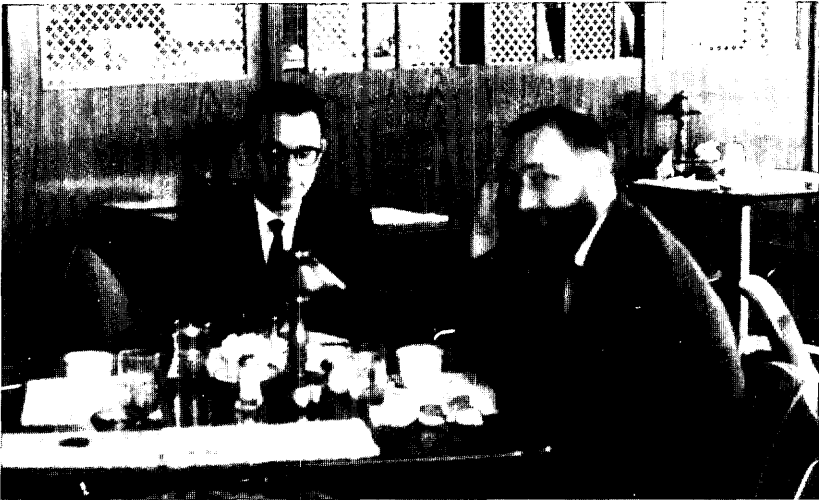


Fig. 6 Fred (center) and Ed Rowe (right) and I (the position was next to Fred, or in front of Ed) sipped a cup of coffee, in the small restaurant in the airport building of Madison. Ed came by a sort of micro-bus, and it was cold almost up to the PSL. Maybe heater was out of order, or simply he forgot to switch On.

It seems to me that there should be a little time for us to get together and renew an old, old friendship during that week. I am amazed to realize that it has been 21 years since I picked you and Fred Brown up at the airport that misty morning and that we are now in our 20th year of operation. I never expected that this business would get so big - we were just trying to do something useful so that we could continue to work and eat!

Fig. 7 Ed's letter of July 8, 1988, that tells me he will attend "The Third International Conference on Synchrotron Radiation Instrumentation", held in Tukuba. Charlie Pruett also attended with his wife, and we got together at the Japanese restaurant "Tukubane" in Tukuba-Daiiti Hotel ; which tured out the last luncheon-meeting for us. You may read Ed says, "I am amazed to realize that it has been 21 years since I picked you and Fred Brown up at the air port that misty morning and that we are now in our 20th year of operation. I never expected that this business would get so big - we were just trying to do something useful so that we could continue to work and eat !"

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b) Nominations and Write-in

To make long story short, I would introduce you my “write-in”, which I sent to Ed Rowe when he asked me to write “Nominations” for the Smithsonian business, in 1994. This is a very coarse story, but you would be able to get a quick knowledges of what we were trying for at the “lonely hill”.

June 2, 1994

Dear Ed ;

Here is my “write-in”. I am afraid nobody will “nominate” us, since there were only two groups around the ring, Urlich and us, in 1968.

Nobody of now a days would know that we were there. I hope my small memoire would help you to write something for the smithsonian people. And I would appreciate it very much, if you would let the Smithsonian man know that the significance of Physics cannot be represented by “a list” only.

Best wishes,

Hiizu Fujita

cc. Ed

Fred

Charlie

Christian

Bob

[Write-in] “Good old days, but it was the toughest.”

May 27, 1994

Hiizu Fujita

In early 1996, I learned from Fred that we can use the light source in PSL, Wisconsin. Since then, I concentrated my desire on obtaining the optical absorption spectra of alkali-halides, by using the facilities. As you

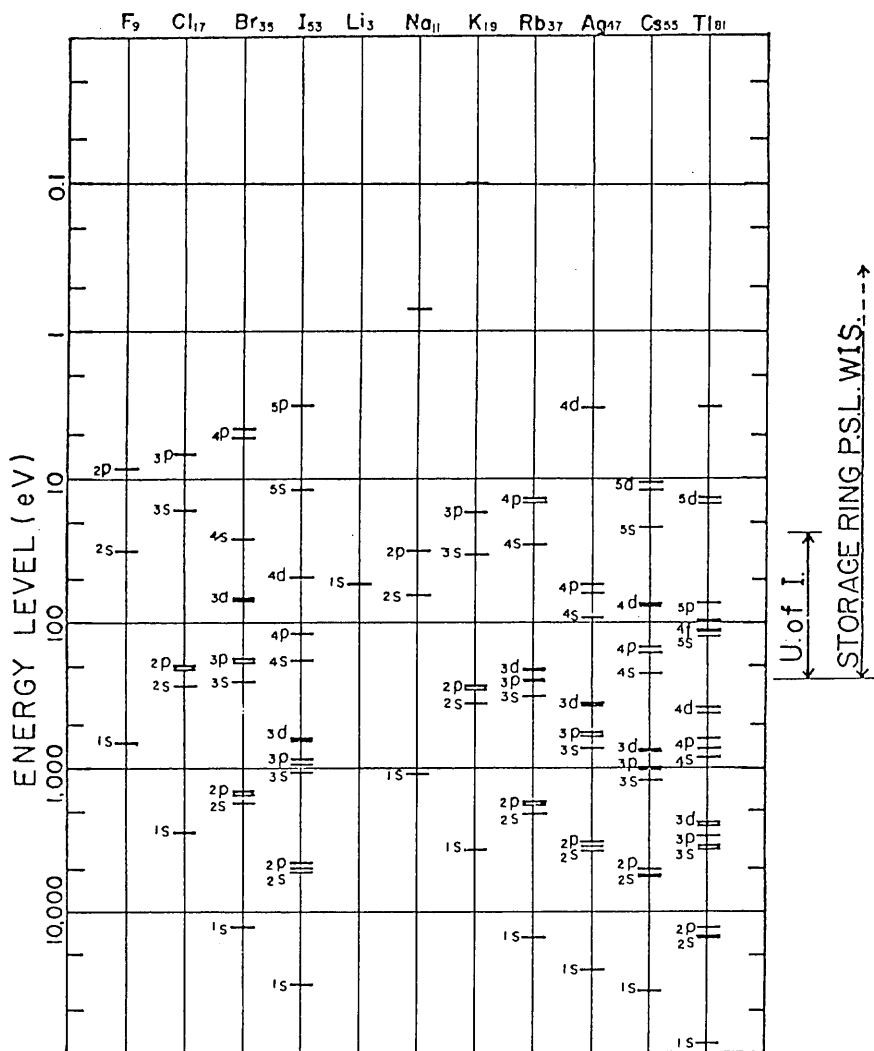


Fig. 8 The Energy Levels of Atoms, especially Alkali-Halides oriented. Actually, I almost aimed at KI, when I came to the States, however, I made this diagram to persuade peoples.

see in the Fig. 8, the PSL light source goes up to 300 eV. While, the monochromator of UI covers from 300 eV to 30 eV. There are many candidates within this range.

Firstly, you will see the 2p-level of Cl falls within this range. However, the absorption spectrum of KCl, due to the p-s transition, had been measured extensively by the Tokyo group. They had found the “core exciton”, which is associated with the p-s transition, by employing the synchrotron light at Tokyo University. The existence of the “core exciton”, by the way, was theoretically predicted by Prof. Muto, and the Tokyo group was dancing for joy of the discovery. There are transitions from 3p-level of Br, and from 4p-level of Iodine within the same range. But these are simply the secondary trials.

Another possibility is to pick-up the 3d-level in Br, or 4d-level in Iodine as the initial state. Of course. Tokyo group had already tried this possibility. However, I heard before I left Japan, that they failed to observe the transition. The reason that they deemed, was due to the stray light within the monochromator. There was the kindest comment I got from Prof. Sagarawa ; who was one of the leaders of the Tokyo group ; he past away on September 27, 1986, at the age of 60. He said : “The origin of the terminology of {d-level} is due to the {diffuse} absorption spectrum. So, the experiment to observe the d-p transition must be very hard.” At any rate, there was no bright glimpse on the experimental side.

Secondly, no Japanese theorist supported the idea to observe “the inter-band transition” at the core level. They mentioned I was too much simple minded in two aspects :

- 1) It is “doubtful” to consider that the 4d-level will make a “band”.
- 2) The optical transition cannot be so simple enough to regard it as “d-p

transition". Certainly, there are singular points which can be considered as "p-like" state, in the conduction band of alkali-halides. But, it is again "doubtful" to consider the "p-like state" as "p-state".

I must point out here that, when a Japanese said it is "doubtful", that means American's "No". So, there were no bright aspects on the theoretical side, either.

The only hope, that I clung to, was that we were going to employ "the storage ring light source", for the first time in the world. The light source must be stable, spatially and energetically. So, we should be able to pick up even the most diffuse absorption, if any.

We moved from U of I to PSL on July 12, (Fri) 1968. In front of the storage ring, a concrete block was fond of me, somehow, and it dropped onto my right foot thumb. It was a very hurt, but I was able to walk on the next morning. More serious thing happened. I forgot to bring the cryostat with me ! So, we assembled the instruments to the ring, and evacuated, but we could not do any experiment. We returned to U of I on July 18, (Th). On July 22, (Mon), we had a "Powwow" in Fred's office. We decided to go with KI.

Our 1st trial was performed from August 5 (Mon), 1968, through 9 (Fri). It was quite a bitter experiment. The beam current was about 10 mA. We worked from 8 : 00 a. m. to 11 : 00 p. m. Every night, we scarcely crawled into bed at the Elmgrove Motel. Ed Rowe gave us his "Super Beam", sometimes, about 20 mA large. The saddest thing was they survived hardly longer than 5 minutes. We tried DC-measurements, and Lock-in measurements ; all in vain. As the final nail, I gave the serious damage to the "Bendix Magnetic Photomultiplier", which costed about \$1000 ! However, nobody blamed me at all. So, we, Fred Brown, Christian Gahwiller, and I, made a "draggel-tail drive" to Urbana.

On the way back to U of I, Fred, who was grabbing the handle, suggested

us to switch our system from the analogue method to the digital method. Another words, he suggested to employ the photon-counting technique. When we arrived at U of I, we had completely agreed to switch our whole system to the photon-counting system ; such as the Atomic-Physicists were doing.

On October 1, (Tue) 1968, we, Fred, Christian, and I, came back to PSL with all our digital gears ; the channeltron, the shaft encoder, the frequency converter, the channel scanner, the photon-counting scaler, the teletype scanner, the tele-type-printer, the tape puncher, etc. Christian was in charge of all.

Back in U of I, William (Bill) Scheifley was ready to carry the evaporated samples to PSL, by driving his brand-new car ; Dodge-Dart. Nicholas (Nick) Carrera, who was generous enough to show me his drawings of his cryostat, (he called it as "Nick's Hope"), was anxious to fly up to Stoughton. Robert (Bob) Bachrach was also generous enough to let us allow to use his favorite evaporation vessel. He was supporting, also, the data handling system performed by Christian.

Nevertheless, the absorption spectrum seemed very "diffuse", and hard to be observed, as Dr. Sagawa had predicted. But, on November 26 (Tue), 1968, at last (!), Christian and I discovered a tiny absorption peak due to 4d-level in CsI. (Christian and I went to Halverson, to celebrate ourselves.) On December 2 (Mon), finally, I got the data due to 4d-level in KI ; I kept staying at Elmgrove until 14 (Sat), alone. (cf. Fig. 16)

On January 25 (Sat), 1969, Christian and I started Urbana for the last mission, for the 13th time. On February 7 (Fri), at 5 : 00 p. m., I said good-bye to the Wisconsin people, at the ring side. They all sung a song, "Hiizu is a charming fellow ~. Nobody can deny ~.", with the help of some bottles of beer ! (cf. Fig. 42, 43)

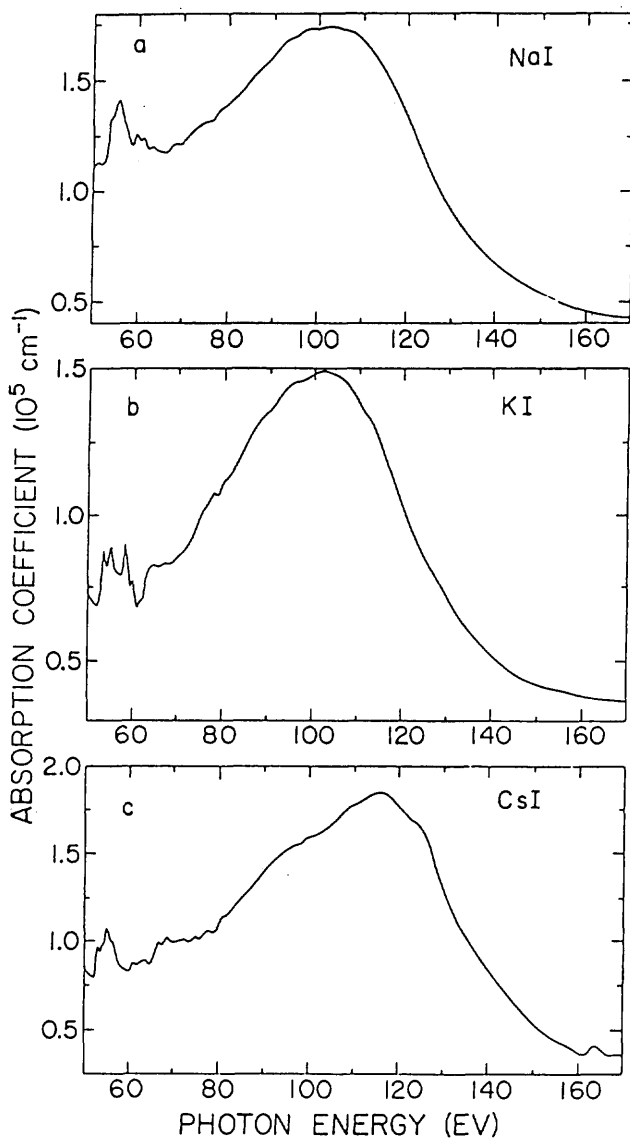


Fig. 9 Absorption Spectra of NaI, KI, CsI. These graphs are the direct output of CALCOMP plotter, which were operated by the programs composed by Christian.

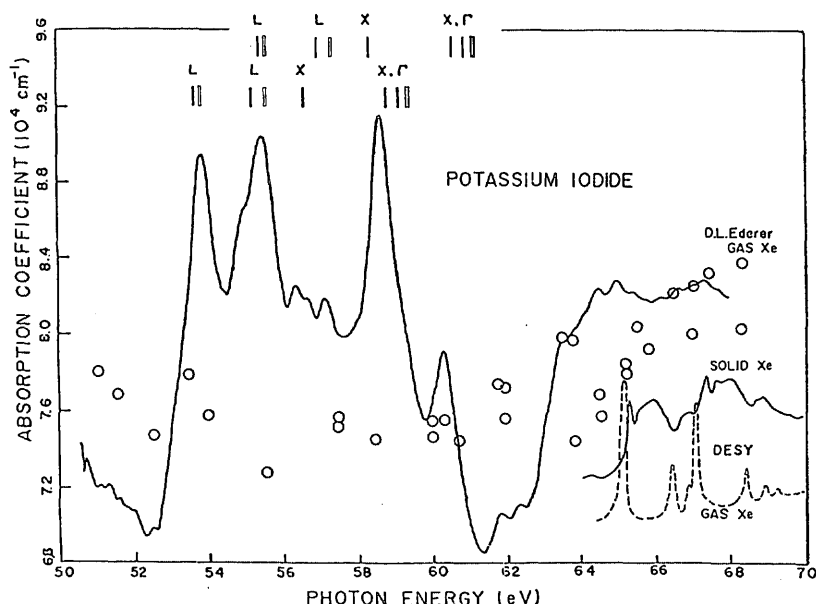


Fig. 10 Absorption Spectrum due to 4d-p Transitions in KI. This graph is simply the enlarged graph of a part shown in Fig. 9, for KI. Some other data are added on the same graph to show comparisons, and the powerfulness of the continuous light spectrum of TANTALUS is fully demonstrated.

As you see in Fig. 9, the absorption spectrum due to the “inter-band transition” is very small, compared to the gross atomic absorption structure. Fig. 10 shows the enlarged structure, due to 4d-p transition. The accordance between the theoretical calculation (band structure) and the experimental results is marvelous. Thereby, the band structure calculation on KI, which was performed by Dr. Onodera, Dr. Okazaki and Dr. Inui, was examined directly, by the optical experiments, for the first time.

For a long time, we noticed that Tokyo and DESY are running far ahead of us. But at the very final 499 miles point, we suddenly found ourselves running at the top of the world.

(May 27, 1994)

c) The Head and The Brain

The author is anxious to introduce you an interesting letter ; which Prof. Almy, Head of Physics Department, University of Illinois, sent to Prof. Miyake, Head of the ISSP (Institute for Solid State Physics), The University of Tokyo. It reads as following ;

July 26, 1967

Professor Shizuo Miyake
Head of the Institute for Solid State Physics
The University of Tokyo
1-22, 7-Chome, Roppongi, Minato-Ku, Tokyo, Japan

Dear Dr. Miyake :

Dr. Hiizu Fujita came from the Institute of Solid State Physics, The University of Tokyo, Japan, is on temporary appointment in the Department of Physics, the university of Illinois, U. S. A., since September, 1966.

He has been involved in the experimental project on the measurement of the optical constants of alkali halides led by Professor F. C. Brown, Department of Physics. The project is quite novel. The group is going to use as a light source the radiated light emitted by electrons in the orbit in the storage ring attached to the electron synchrotron in Stoughton at the University of Wisconsin. This method is not only new in its technical sense. It should surely produce extensive new information on the intrinsic properties of alkali halids, especially on band structure.

Dr. Fujita is planning to perform an experiment in the very far ultra violet region, $60 \text{ \AA} \sim 1000 \text{ \AA}$, with good accuracy. The measurement is expected to begin in the late fall. The complexities of working with a new source of light at site away from the university have caused some delay.

It should be appreciated if he could prolong the period of his stay here over the coming year, September 1, 1967 to August 31, 1968. He will receive his salary for the period from the University of Illinois.

Yours sincerely,

G. M. Almy

Head of Physics Department

The author is anxious very much to make a brief comment on this letter : Were it be sharp enough with the Head of ISSP, he should had been stuned by reading the Professor Almy's letter. Dr. Almy spelled out what's going on in the States. The later turmoils, scientifico-politico-sportivo sporco, that hit ISSP, would had been cut a swathe before they cut-in, if he could understand it and took an wise action immediately. Obviously, he took the letter cut-and-dried ; he may had thought that I was asking to prolong the limit of my staying in the States, just because to enjoy the way of US life further.

What's more, the Head had no Brain at all. I sent a xerox copy of "A Solid State Panell Subcommittee Report, March 6, 1966 : Synchrotron Radiation as a Source for the Spectroscopy of Solids ; by F. C. Brown, P. L. Hartman, P. G. Kruger, B. Lax, R. A. Smith, and G. H. Vineyard" to a Full-Time-Staff of ISSP. However, I didn't receive either "thanx-letter" nor "arrival-notice". I should had been realized at that moment, that he was putting on a stuffed-shirt. I was no spring chicken, but still too young and innocent, you know !

§3 Valueless Treasures

It's getting hard to recognize for peoples that there are valueless Treasures in this world. The word valueless does not mean that its market price is zero. Nor it means the price is astronomically high. It is related with the modern mathematics, if you insist to understand it by the term of science.

Ever-since Adam Smith got started on the Basis of Exchange of Equal Value, in 1789, you've dropped into a well, and nobody ever crawled out of it again. From Adam Smith to Dr. Stiglitz, all lives in the Egyptian Age. Their axes have only rational numbers. It is as bad as the Solid State Physics. Maybe someone had suddenly realized that it is impossible to measure the Value only by the fractional numbers, then, your government stopped to invent bellow Quarter Dollar Coin. Obviously, carpenters and maybe tailors were a little bit more optimistic, and they went down until $1/64$ ". But it is the same thing. They got to stop to think at last !

I don't know who, but someone switched to decimal system bellow $1/1000$ " ; one mil. So, everybody was happy and didn't see anything wrong. Even Dr. Neumann may or may not be realized that he was still in the well. It is amazing that Dr. Neumann lived in the world of complex axes of infinite dimension, but still did not find he was fighting a losing battle against the demon of infinity.

If you think that the infinity means a huge number, you are a man of 17th Century's. Infinity is in front of you. Simply draw a circle, and divide the circle length by the diameter. You'll hear the laughter of infinity demon. You may call up Dr. Neumann, and work with him on a super-computer. Print out the value of PAI as long as 1000 miles. But (!), you got to

switch-off some day. It's obvious that NSF won't support such a project FOREVER ! Then you lost the combat. 1000 mile long printout doesn't mean anything but ZERO, compared to the INFINITY.

I guess you see the point. If I put a price tag, named $\$ \sqrt{2}$, and said "I won't keep my change, because I'm not a George !" then you see, you cannot buy and I cannot sell. This is because the Value is not defined at the irrational point. Adam Smith dropped into the well too hastily. Needless to say anything about e-money. Dr. Neumann, the exit is over there !

This story may remind you the Merchant of Venice. Actually he got a simple trouble of Humpty-Dumpty Problem, and even the beautiful Judge was dwelling in the Egyptian Age. Of course, you can get to $\sqrt{2}$ pound by continuously adding the fractional numbers, but nobody has infinite life. The demon laughs over there !

French people are apt to say everything romantic ;

L'amour, c'est pour rien	Love is valueless
Tu ne peux pas le vendre	You cannot vend it
L'amour, c'est pour rien	Love is valueless
Tu ne peux l'acheter	You cannot buy it
Tu ne peux pas le prendre	You cannot take it over
Mais tu peux le donner !	But you can give in !

Non. I won't give it to anyone. And, if you want to take it over, you will only be able to do so after you step on my body. We accord with you intuitively, but the conclusions are different after all ; you opened Paris, but we burned Tokyo ! You will see what I mean in the following ;

- 1) One day, in 1966, Fred began to put off his old laboratory-robe, in MRL. He put on a brand-new white robe, and he stretched his arms and said ; "This was a famous robe, but I will take a new one. I start the new project, today ! Farewell my robe !" He picked up a few pieces of steel cutting bite out of the old side-pocket. Then he rolled up the old robe, and squeeze it into a trash can. All happened in front of me, in a few minutes !

As soon as he wallked out the lab, I pulled out the robe. This is not HIS anymore, since he put it into the Janitor-Space. (He abandoned his right of possession). He should had been careful enough to know, that I am such a kind of human being who can understand the Problem of Infinity. Soon I noticed, that the oily cloth got a woven Name Plate on the inside of the back. This little area of the cloth, which reads "Frederick C. Brown", makes this junk Valueless !

I don't know what was going on in UI Physics Department, when, we call, it was the Mecca of Color Center Physics in the World. However, it is very easy to imagine that Charlie Slichter might had gazed at the oily spots, while he was talking about the data of F-Center with Fred. Bob Maurer would had been annoyed by the spreading smell of the machine oil all over his office when Fred dropped in for asking to raise the budget.

Later, in Japan, I showed it Fred that I picked up the banner. His response was just very brief ; "Oh ! No !". Now, this time it's hard to see what "No" means. English is more difficult to understand, sometimes, than Japanese ! At any rate, I dried it up in the sunny summer days for three years, since I can't wash it up. Smell of the machine oil is gone now.

Operation of Print out System

Power on :

- Cambera (- Mecktronik Frame)
- Taktronix
- Teletype (only plug-in)
- EG and G
- Monsanto Timer

Connections to make :

- For the rate meter :
positive pulses coming from
a blue module
and caga → BNC
→ to be plug only on rate meter

- For the scaler (with visible display, Cambera 1473)

Also connect a signal cable
(negative pulses) coming from
a ~~Teletype~~ Fan out module
(green)

Operation:

Microswitch resets every 6 seconds.

Adjust counting time on Teletype to 4 seconds

Switch position on Scanner 1488

Mode: Ent, Recycle

Format: Continuous

On switch:

Parity: odd

Switch position on Control Module

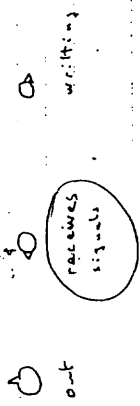
Stop Switch should be on MSW position (downward)

Max Monitor DC is 1.5 V

gives 1000 mV \rightarrow 1000 cps

Operation of Teletype:

Switch 3 position



for tape punching: only slip blank tape in

Driving motor

Small box with 2 switches

ON \rightarrow UP \rightarrow Dial going upward (increasing number)

OFF \rightarrow DOWN \rightarrow Dial downward (decreasing number)

Clutch: 10-12 V

Start a scan

1. First check if microswitch works properly and data are printed
2. Skip lines in Teletype in order to start a new line
3. Push Depress Reset push button on Scanner
3. Position Dial on starting position
for ex: 234.50
or 200.00
4. Position cam knob just under microswitch lever in order to start straight away
5. Adjust Clutch voltage 12.5V
6. Start Motor

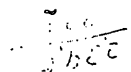
Bendix Voltage :

1600 V across dynodes
300
350

Monitor Voltage :

Position 5, 6, 7, 8

Variable Counter Clock Wise



Scan speed

Motor: 110 RPM

6 seconds

Gear	Box	Position	A	2:1
1	1	1	1	1
2	2	2	2	2
3	3	3	3	3
4	4	4	4	4
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86	86	86	86	86
87	87	87	87	87</

Dial: 5 RPM

1 turn in 12 seconds

1.1.2 234.50

234. 00

233.5

233.0

232.5

2. Number Lines, 232.0.

231.5

231.0

230.5

2.30:0

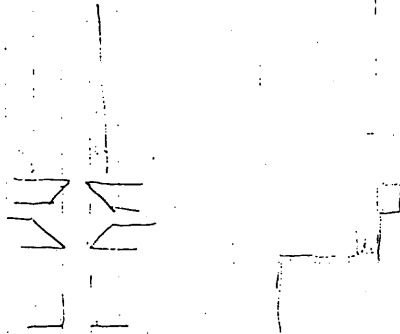
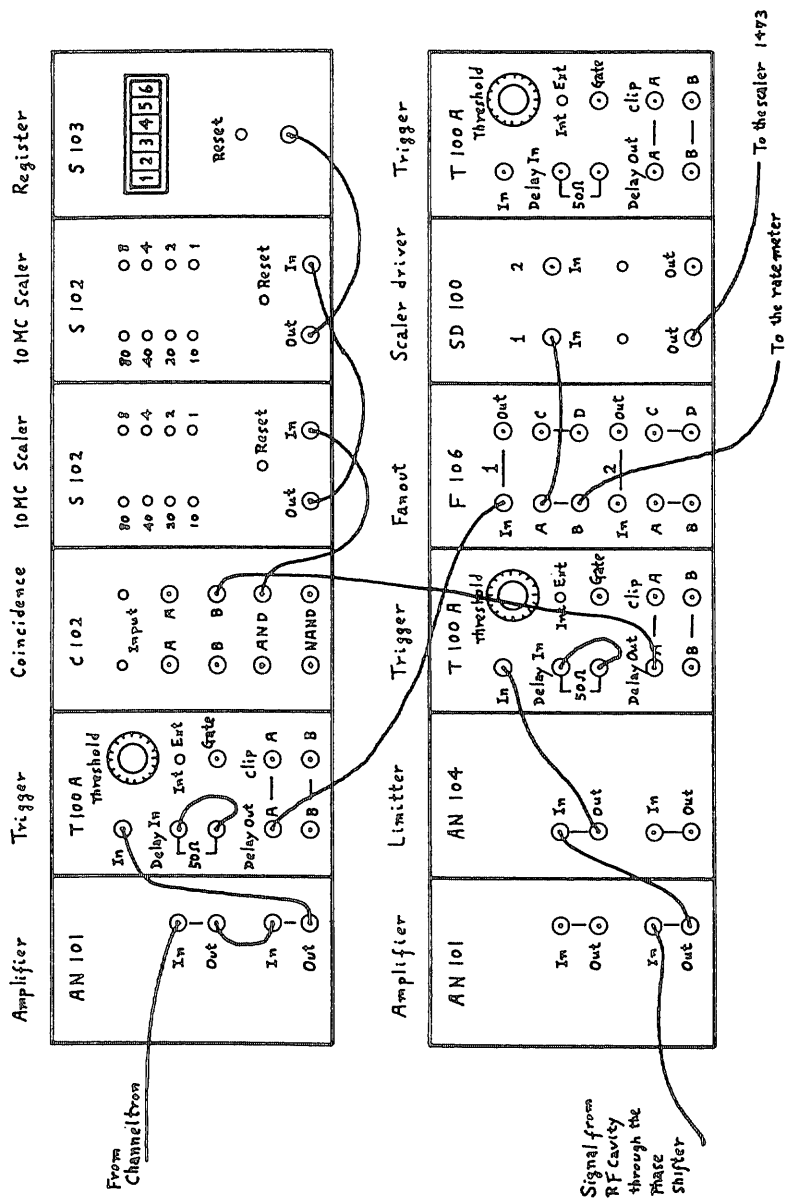


Fig. 11 The Instruction Manual for Electronics. Christian made this manual for me, so that I would be able to operate the system alone at Tantalus. This is one of the secret why we could work so efficiently; while I was taking data, Christian worked for setting up the data-handling computer program.



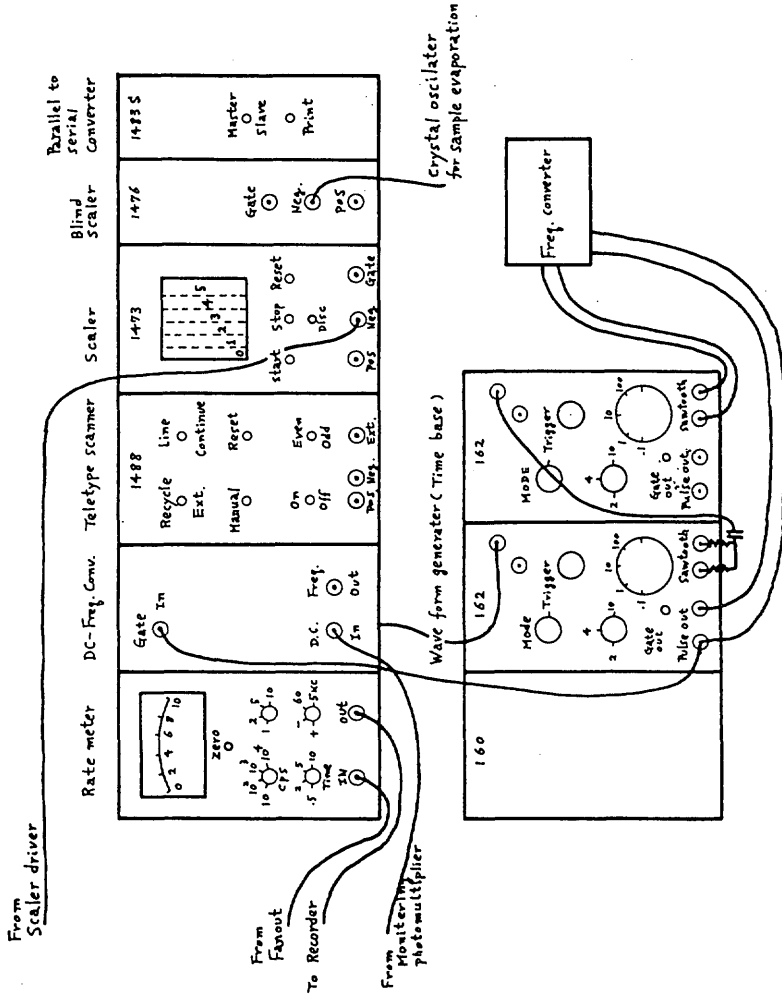


Fig. 12 The electronics system and wiring of the units, assembled on the CRAYTOR. If you compare the units with the Christian's Manual, you would feel you could operate the system by yourself.

- 2) Swiss is the place where the most accurate and precise folks to live. I don't know anything that Japan can make them feel envious. When I stopped off at Zurich, I'm convinced hundred percent, that it was only Swiss people that could make the precious twist watches. Everything is so completely organized, even at every driving corner and/or the parking place.

As my Treasure, I'll show you what Christian gave me. Fig. 11 is the Instruction Manual which Christian made. This is especially written for me so that I would be able to work alone in Stoughton. He wrote this in his office in Urbana. Christian drew every lines and evry pages by his memory. There were no drawings nor circuit chart at all on his desk. If you would compare his Manual with the circuit system as shown in Fig. 12, you would be astonished how accurately it is stated, what's more, in print style !

This is one of the big secret why we could work so efficiently. I had no problem at all with this Soft-ware. I could stuck to the Ring, alone, how long it may be. While Christian could concentrate on his data-handling job, back in Urbana. I didn't care at all, where the place for lodging maybe ; whether it may in Elmgrove Motel or TraveLodge (sleepy bear !). I might add some little thing to decolate my valueless treasure (cf. Fig. 13).

- 3) Fig. 14 is the route map that Ed Rowe gave me for his warm invitation. He kindly invited me to his home, on November 8, 1968 (Fri). I decided to stay alone over the weekend, in Elmgrove. Ed Rowe said "If you are alone, why don't you come over to my house." In his home, I met with his family ; his wife, sons and a daughter. I was quite impressed by the eldest son, Andy. He spoke out with the wealthy vocabulary ; I



Fig. 13 Hand soap of the Northwest Airline and the SLEEPY BEAR Motel. You would be interested in to notice that, it says "THE FAN JET AIRLINE". Fred named the TRAVE-LOGE MOTEL as THE SLEEPY BEAR, due to this trade mark.

felt as if I were reading the New York Times. Fig. 15 is the McFarland All Stars, in 1968.

- 4) Fig. 16 is the Copies of my Lab. Note. Fred suggested me to jot down "All the things on to a Computation Note Book". Sure, I wrote everything on the working note, when I was in Urbana. However, it was too large, and not so handy for the field combat. So, I kept the quick items on the Follett's note book. I remember the day when I noticed the little evidence for the d-p transition in Alkali Halides. I was alone in the Sleepy Bear, and made a long distance call to Urbana.

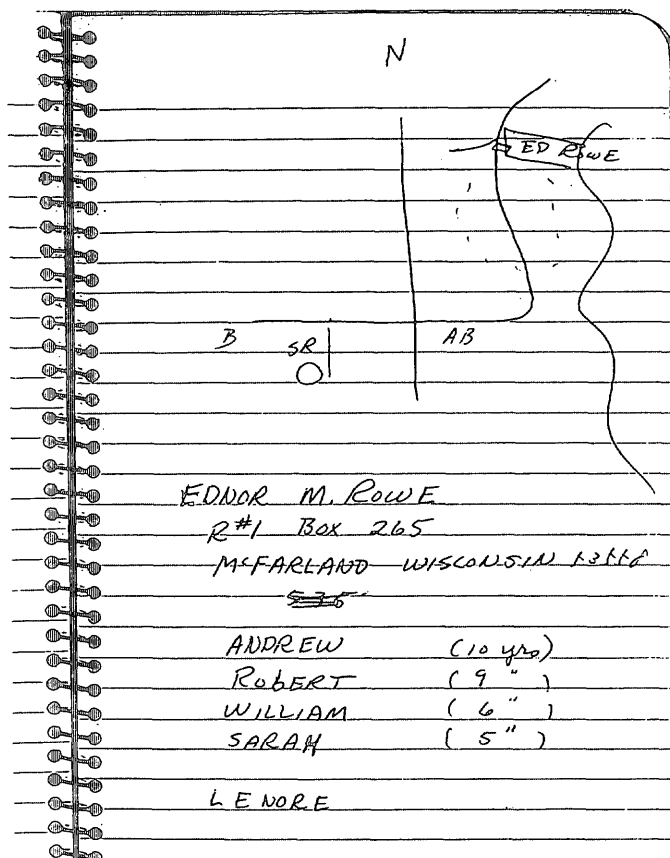
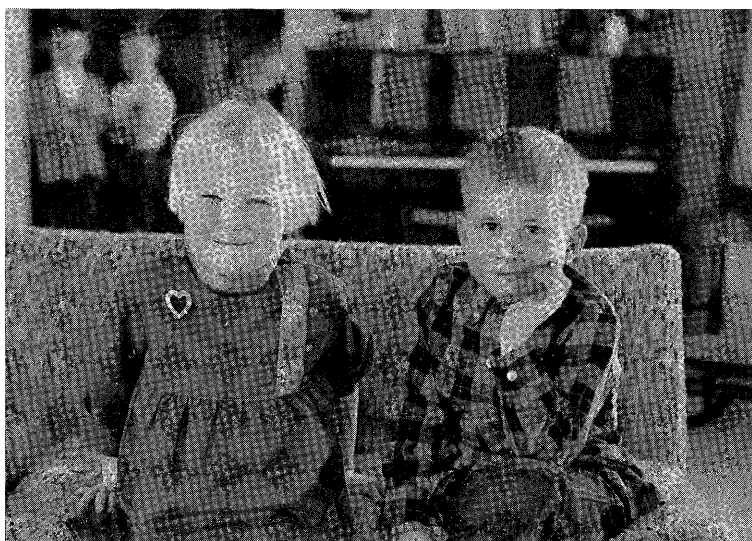


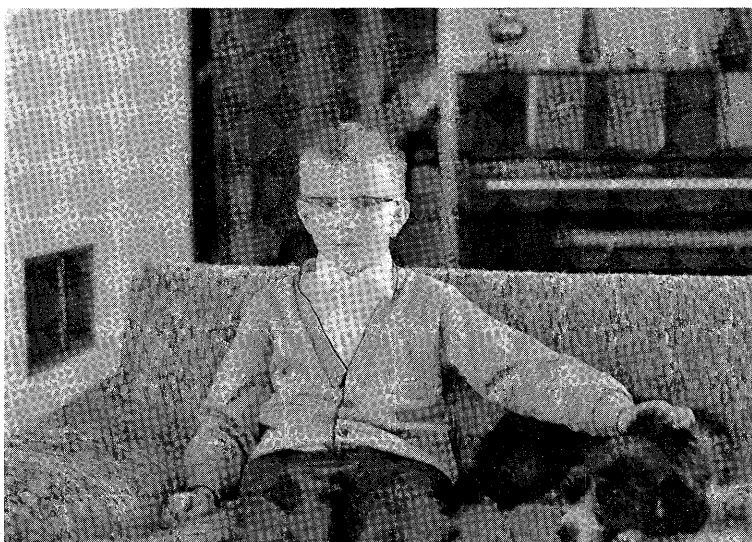
Fig. 14 The Route-Map that Ed invited me on November 8, 1968, (Fri). Andrew (Andy) was only 10 years of age, however, he spoke with wealthy vocabulary ; which made me feel as if I was reading THE NEW YORK TIMES. "What sort of a man he will be ?" I said. Then Mrs. Rowe answered immediately ; "Lawyer !" However, I replied, "No. He would be a SENATOR !" I don't know well whether SENATOR is a respected species in The States, but still think that if he were a senator, then US-Japan relations would had been easier.

Incidentally, the crossing point on SR-Ab is the spot where I was Frozen-in under Freezing-Rain (Ice Storm), on December 6, 1969 (Fri). We were four in all ; a jumping-in UW girl-student, a supposedly Saturday-Couple, and myself. The International silent party was held in UI Dodge. After 3-Hours of silence, the "WINDS OF GOD" (KAMIKAZE) came in from the South with Heat Wind Blast ! The party was over ! And no traces were left, when ice was melt away ! (in Part II ; in Japanese)



SARAH

WILLIE



ANDY

McKENZIE



Fig. 15 The McFarland all Stars : Sarah appeared for the curtain call with banny night cap.

Fred said "Congratulations !" and showed up about midnight by flying to Madison. It was too early to congratulate widely, but it was the beginning of the real breakthrough. We need not think about End Run any more !

- 5) Fig. 17 is the collection of my valueless treasures. I believe I don't need to say too much. You know what Powwow means, and you know what does it mean when Fred said "Don't drive" ; Heavy snow ! Mr. Burkhead, head of the MRL purchase office said when I asked to arrange a university car ; "You need a sled instead of a car, don't you ? Doctor Fujita ?" "Yeah, with one hundred dogs, please !"

- 6) Fig. 18 is the Bob Bachrach's letter of consolation, that I received when I got back to Japan. My mother suddenly died two weeks later of my landing. I didn't speak out the situations except to a few friends. Bob's letter, and Dr. Philip K. Baltzer's few words, who was my new boss in RCA Lab., Tokyo, touched me at the deepest point of my heart.

I am looking for the route map that Bob invited me at the last moment before I leave Urbana. He lived his own house in the East End of Urbana. He invited me to have dinner, so I followed his map in the evening. I thought I had to share the conversations with his friends. I was a little bit uneasy to think about the subjects that would be offered onto the table.

Actually, it turned out I was the only guest for the evening ! What's more, the dinner he made himself was very decent. The dinner table, somehow a little bit too big for only two persons, was covered with a heavy white table cloth. The dinner started by a double-dished formal and elegant soup. All was prepared just for me alone ! I've forgot on what subject I talked. However, it is sure, I was thinking of the Thickness of The American Culture.

Average Japanese says that US has no culture. They would believe that Japan has the wealth of traditional culture. But, behold this ! Who on earth of the Japanese graduate student can invite a foreign colleague at this sort of decent table by himself ?

I'm sure I didn't discard his inviting drive map, but it won't come out so far ! So, this is a Virtual Valueless Treasure, which gives Dr. Neumann more than beat.

- 7) Finally, I would like to invite you to Halverson ! "Be my guest, please !" Fig. 19 is the paper table-sheet, which gurantees you to get a

Tv Kd. check

Kd.

$M_0 \sim 900$

I_{Kd}

around 12.5

$$1.10^3 \times \frac{80}{277} = 384.1$$

cps.

$I_1(46)$

Man 600

$$f_{1.0}^2 \frac{151}{277} = 27.3$$

$I_0(43)$

M_0

Higu

Please do not drive.
See me at 10:00. Thanks

Fred

Higu

MAY 10 1968

Can you meet for a
pow wow in my office
at 2:15 P ? (Today) ?

Fred B.

Please leave in
position.

Thank you

F.B., H.F. & C.G.
also W.S., J.W. & R.B. !

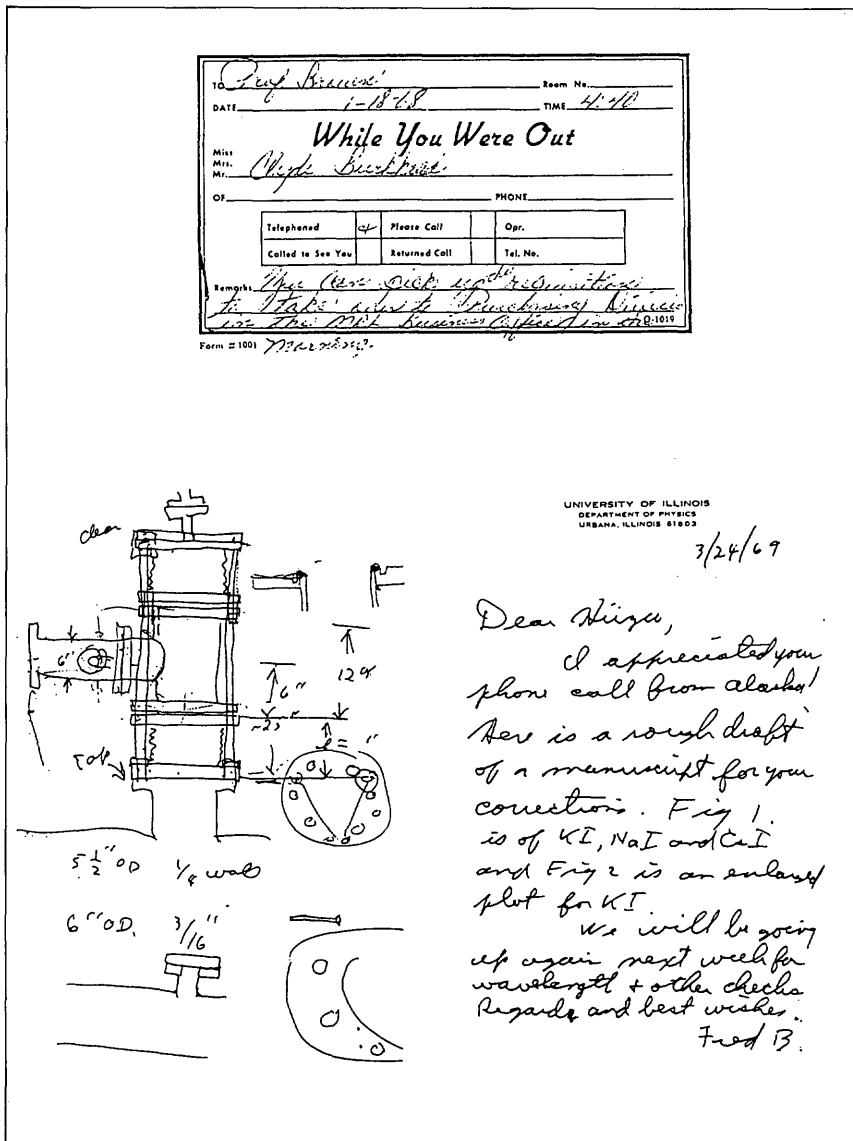


Fig. 17 Collections of Memo and Messages. Of course, "do not drive" means Heavy Snow, and you know well what "Pow-wow" is ; Christian came from Swiss, and I came from Japan.

Dear Hizu,

5/11/69

I recently learned of The death of your mother. I know That nothing anyone can say can ease your grief and sense loss, but Please accept my deepest sympathy and regret.

Sincerely,

Bob Bachrach

Fig. 18 Bob's consolation letter. My mother had an apoplectic stroke on April 9, 1969. It happened about two weeks after my arrival ; I came back from the States on March 23, 1969. I was in the conference room in Tokyo RCA Research Lab, when I got the news on the day. I was not surprized at all, since I knew she had high blood-pressure. However, she died within 30 minuits ; everything was so simple and quick, as if it were the 1st-order phase transition.

"Good Meal !" "You are eligible to go to the Salad Bar !" You can get T-bone, Crab, or even Scarops ! Where did they from ? Don't dig up minor things ! From ocean , (of course) !

There is a Piano-Bar ! That makes you really feel that "You Are in America !" Dressed country folks (don't call them hicks ; they are quite well dressed and well behaved, and mid-thirty or above) are sticking all around the piano. They sing and swing for quite an hour ! I could not be so brave enough to take a picture ! Let me appologize for having nothing to show you except Fig. 20. Everything is vividly in my memory, but it's too bad this is monochromatic.

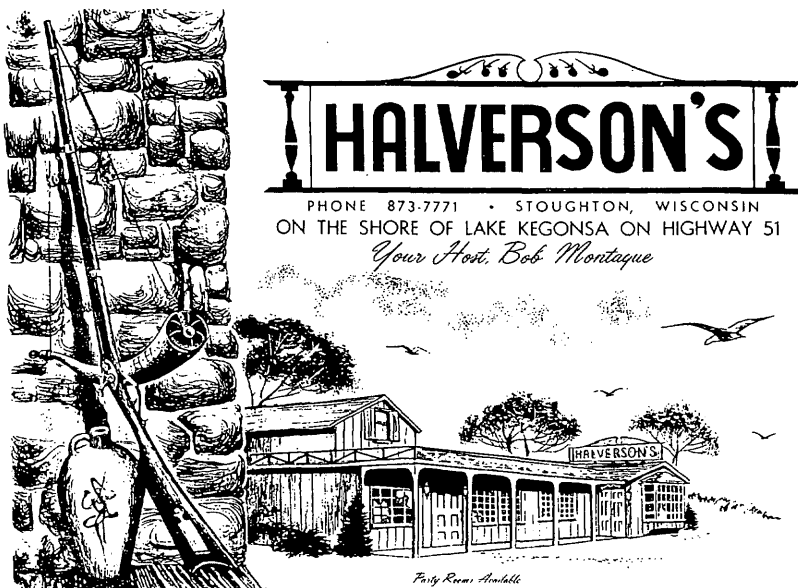
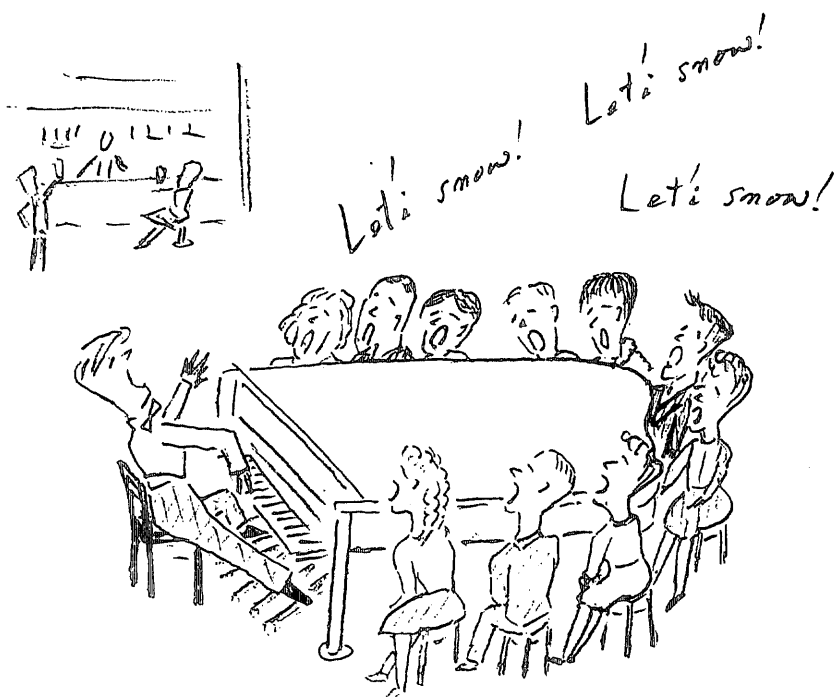


Fig. 19 Halverson's paper dish-sheet. You would agree that the place must be an interesting and decent place to EAT.

The only sad thing is that you can't take Alcohol onto a dining table ! Americans do invent really strange things sometimes ! I was served a glass of Manhattan even in the Utah State ! ; but in this sort of Separate Place ! In Utah, they said, that the private bottles were just kept in the Private Closet, with heavy locks of course. And the young man who are rattling a shaker in front of you is just helping for you to blend. Therefore, he is Not Vending Alcohol at all ! Great !

Fred never allowed me to get another cup of "Manhattan Old Fashion !" That was the real something I've never tasted ! Fred insisted "No. Stop Hiizu ! This is strong !" I knew ! But, I'm still suspicious, even as of 1996, that this could had been a kind of discri-



Halverson Piano Bar 11/7 9/26/86

Fig. 20 Halverson Piano Bar in 1969.

mination, so that they won't vend cocktail except white? If this could be happened true, Fred must had been suffering a sort of heavy dilemma, which I had not awared of at all. I don't know!

§4 HEROES of THE ERA

In the middle of April, 1994, I received a printed latter from Ed Rowe. It was dated as April 7, 1994, and probably many of the readers of this article would know the content of it. This letter will become surely a very famous and important document in the History of SRC.

However, the letter is rather lengthy and full of vocabulary and style that reflects Ed's personality and his sense on American Literature. I would save it in the Appendix for the future historians. As one of the Busy-Contemporaries, I hastily looked for his conclusion. Near the bottom of the first page, I saw he wrote, "Our preference is to donate Tantalus to a museum". To a museum? We old Tokyo-downtown-ite frequently utter, "Get off to a museum! You old fool! (Sit there quietly! Don't horse around!)" These words have no philosophical meaning at all, not like as the famous phrase, "Get thee to a nunnery!" So, I didn't feel strong impression. I have to confess, I thought as if I heard "Tantalus've got old at last!"

But on the next line, I found he wrote, "at the Smithsonian Institution". Smithsonian? That is the garage, which keeps the crazy airplane equipped with so big "Fill'er up", that the 25 year young man couldn't see foreward at all! But, it can be an interesting idea!: I thought;

[If you be honest and fair, Tantalus, your honesty should admit no discourse to your beauty! Get thee to the Smithsonian!]

However, on the page 2, in the final section, I found again difficult words; "Please send your nominations". Nominations! I guess I know what it is. It's the crazy but joyful polical Carnival, which keeps US young forever! But what on earth to do with Tantalus, which is siting in the quiet "lonely hill"? I felt as if I were a Rip and asked "Federal or Democrat?" A quar-

ter of a century made a great cleavage between Ed and myself. C'est encore loin d'ici ! (It's still far away from here to US !) At last, I sent Ed a white hanky.

May 23, 1994.

Dear Ed ;

Thank you very much for your letter of April 7, 1994. Time flies like an arrow, and it is the end of May, now. The reason for I am in delay of responding your request is, I am afraid, I do not understand well the meaning of the word "nominations". I understand tentatively, however, that you are asking me to write a brief comment on our good old days' work ; especially on Physics. I am going to send you a "write-in", before the dead line.

I believe Fred will write you also, so my memoire should be a very brief one. I don't care whether you would "reproduce my letter in whole or in part", because, I believe, the copy-right goes to the receiver of the letter.

.

I did not receive a X'mas card from Charlie, but hope he is all right.

Best regards,

Hiizu

And, you saw the "write-in", already in §2.b). The next Ed's correspondence was his X'mas card in 1994. 'He wrote ;

Dec 11, 1994

Dear Hiizu,

Your letter in support of my efforts to get Tantalus into the National Museum was a delight to read. Those old days came alive for me. I have thought for a long time that the real heroes of the beginnings of Synchro-

tron Radiation in research were you, first users, you and Fred and others were the ones that made it a success. Thank you.

The situation with regard to Tantalus is that a proposal, written by the Curator and his staff to put the old machine on display is under consideration by the display committee there. I had hoped that I would know more by now, but "The mills of the Gods grind slow", but if we are successful, you will have contributed a great deal. Thank you again.

I hope all is well with you and yours. I wish you a calm and productive New Year.

Ed

The result is as you all know well.

Another historical letter came in. The date is February 14, 1995. This time the letter is rather compact ; just two sections. Ed wrote ; "On January 20, 1995, I received a letter from Dr. Paul Forman, Curator for Modern Physics of the National Museum of American History, advising me that the museum has authorized the acquisition of Tantalus and Fred Brown's original beamline for preservation." Again, I'm convinced that almost all the readers of this article would know well the rest of the sentences. For the sake of possible Japanese historians, I save whole contents in the Appendix.

However, the second section sounds like to be composed just for a private purpose. I cannot give you clear-cut answer yet on this point, but for the sake of possible historian, I might print it here ;

"It is possible that at other, later, Synchrotron Radiation facilities, the work that you did here in those old days may have since been done better, but there is little doubt that you did it here first. I have always thought that the real heroes of that era were the Users. You abandoned your com-

fortable, home laboratories, traveled great distances (in some instances internationally !), to the inhospitable northland to use a sometimes unpredictable, cranky machine that was buried in a dingy, uncomfortable hole in the ground, and there produced an incredible amount of first rate science. In addition, you, literally, showed the VUV Physics and Photo Emission Communities "how to do it". If credit is due, it is due to you. I thank you all for allowing me, and the SRC staff to participate in your marverous accomplishment."

I've been complaying that the Japanese sentences are very vague and full of ambiguities. This is simply because the Subject-Noun (or Pronoun) can be infinitely diminished, even down to absolute zero ! But now, I saw the limit of clarity of the English also. Who did he mean by "You" in the above sentences ? I regret that the university people do not have a habit to show the distribution list by putting c. c. (carbon copy). At any rate, I sent him the congratulations letter.

March 1, 1995

Dear Ed ;

Congratulations! I thank you very much for your letter of Feb. 14 and 21, 1995. You have done the very decent and fine job from the very start to the finish up of the Tantalus I ! Smithsonian must be the place for the Tantalus I to find his rest. It will sit there, and "shall not perish from the earth".

I remember still, clearly, the morning I met you first at the Madison Air Port, on April 16, 1967. You, too, mentioned in your letter of July 8, 1988, ; "I am amazed to realize that it has been 21 years since I picked you and Fred Brown up at the air port that misty morning and that we are now in our 20th year of operation".

I remember also, when you guided us to the "dingy, uncomfortable hole in the ground", to show us the Tantalus I. There were only "Bending Magnets" and the "Central Pillar"! No doughnut ring. You mentioned, the ring is under vacuum testing down in the Lab.: might be. I got a very strong impression by the scene. I thought I was looking at a Stonehenge of 20th Century's! That was the beginning. It was quite a day!

It's very nice and delicate of you to recall the hardships that us "Users" must be suffered. However, at the same time I believe, you people, Ed, Charlie, Roger Otte, Richard Fasking, John Budden, Darrell Klinke, all should proud of their endurance and perseverance of those days. These were, also, "the real heroes of the era". We were all on the same "tiny ship". I have never had even a moment to wonder who were the heroes and who were not. I quite enjoyed the sense of unity, in the green shabby operation room on top of the "Lonely Hill".

.

—So, now I can live without worrying about the bread of this day. I wish I should be able to enjoy these cold but calm-blue-sky days, just like the winter in Tokyo. You should bless me for my finding out of my final subject.

Finally, congratulations again for your endeavours on Tantalus I from START to END. I should be sure to be happy to face the machine, if I would happen to visit the Smithsonian in the future. Thank you very much for your considerations. I wish you should find a joy in a long heavy job to disassemble and to pack up the Tantalus I.

Best regards,
Hiizu

§5 Midwestern All Stars

Following photographs are the snap shots of the Combat, held around the “Lonely Hill”, from 1967 through 1969. In 1971, at the UV conference, which was held in Tokyo, I asked Charlie, “The Ring is still there ?” “STILL THERE !”, he replied vigorously !

Today, as of 1996, I feel the photos look like, “THOSE WERE THE DAYS” !

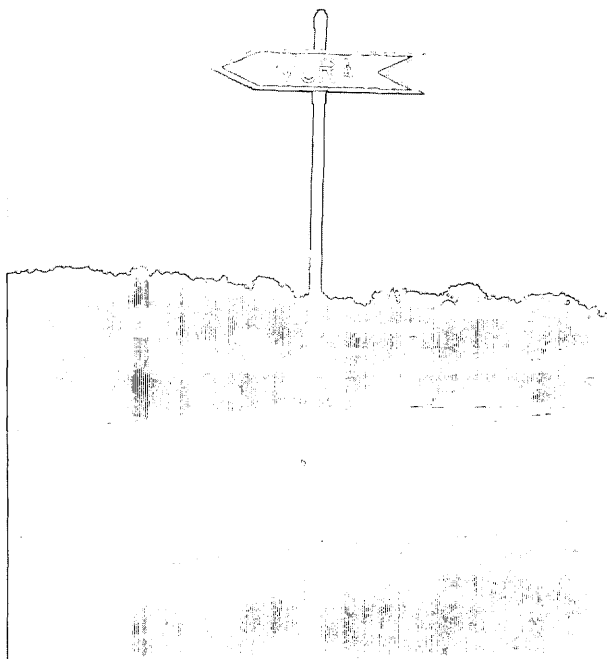


Fig. 21 Street Pointer to MURA (Midwestern Universities Research Associations).

“Which way to go ?”

“What to do ?”

“You got to beat your brains out over there, I tell you !”

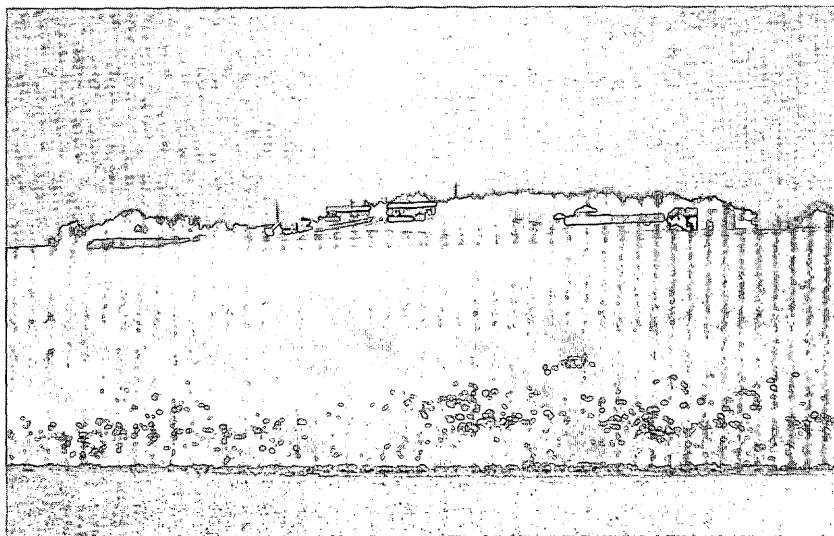


Fig. 22 Lonely Hill : "It's so beautiful in summer !"

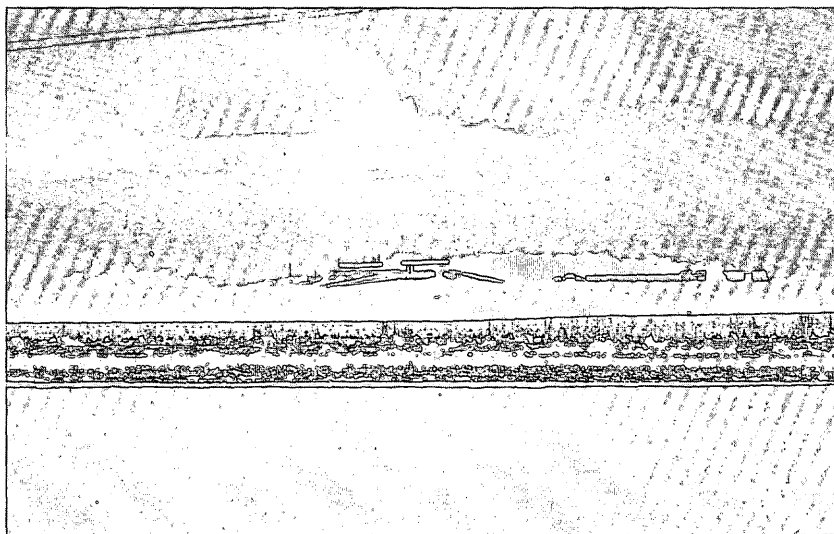


Fig. 23 Lonely Hill : "Wait until winter !"



Fig. 24 Fred Wise in front of the Ring-Door : Head of the machine shops, both in Physics and Material Research Lab. (MRL). UI group moved in on July 12, 1968 (Fri). Fred Wise drove the "Red Corn-Dump", and I sat next to him.

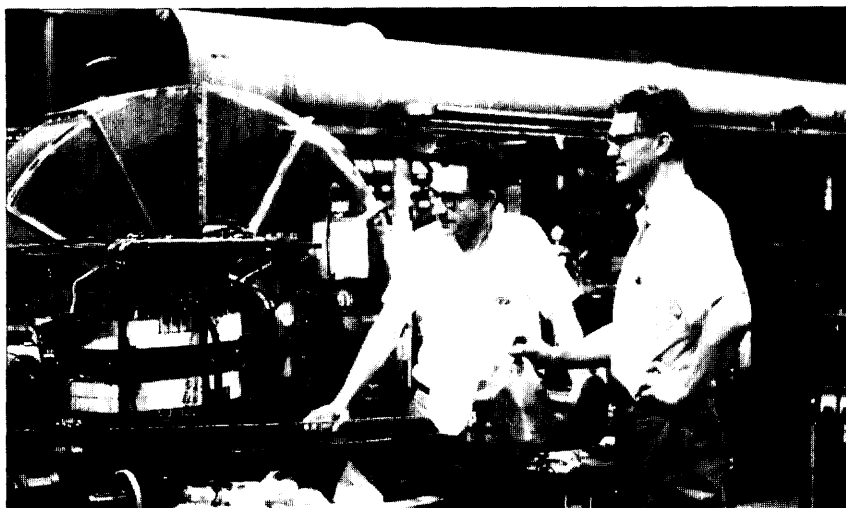


Fig. 25 Fred Brown and Christian Gahwiller (left to right) : They are setting the main frame in position to the viewing port.

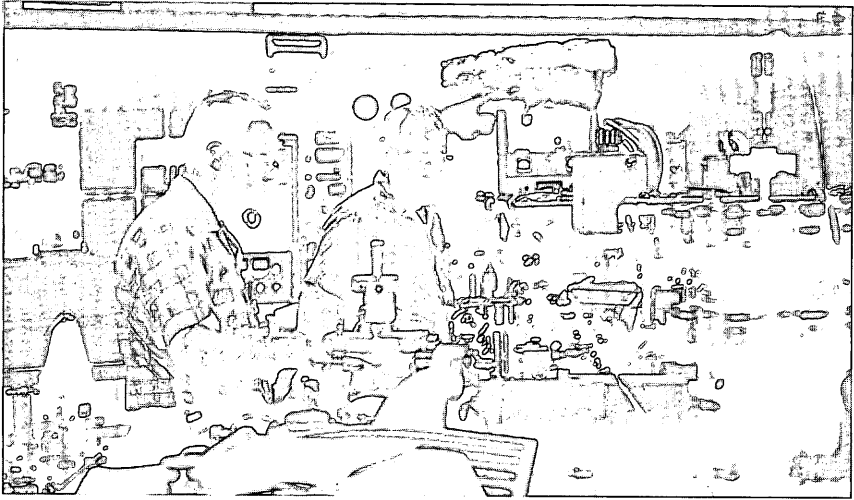


Fig. 26 Charlie Pruett (left) and Ed Rowe : Charlie is evacuating the last small amount of air, that is left between the PSL Straight-Thru-Valve (Granville Philips) and UI Gate-Valve. Charlie has a special Double-Mate-Frange which can evacuate the air sideways by using a cryo-pump.

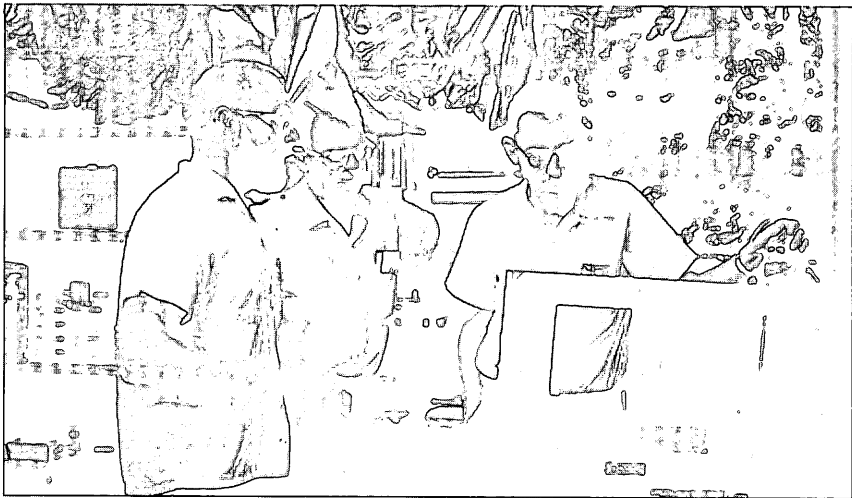


Fig. 27 Ed Rowe, Charlie Pruett, and Fred Brown (from left to right) : The first moment that UI Analogue-Data are showing up.



Fig. 28 Hiizu Fujita : "I am no spring chicken, but~".



Fig. 29 Christian Gahwiller ; He is adjusting the Timing-Cam of the Tele-Type Printer.



Fig. 30 Ring side : EVERYBODY'S HAPPY ! (from left to right ; Ed Rowe, Christian Gahwiller, Darrell Kline, Charlie Pruett, and Dick Fasking)

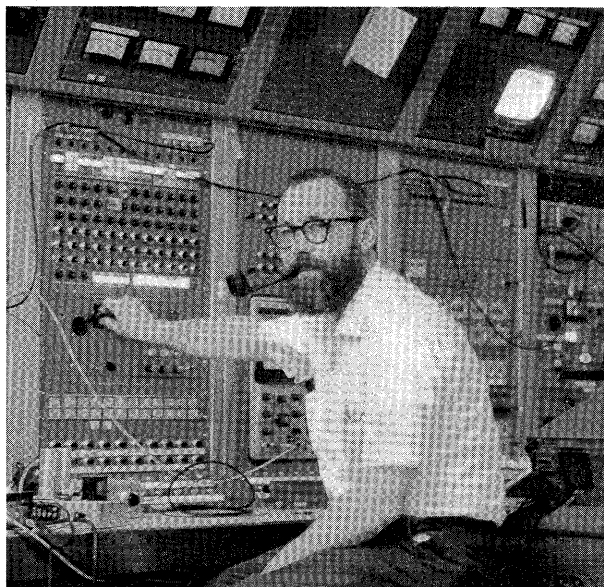


Fig. 31 Ed Rowe with his pipe : In front of controll pannel for the Storage Ring.



Fig. 32 Roger Otte : In front of the entrance/exit door of the FFAG control room. He is going home.



Fig. 33 Charlie Pruett : At his office desk ; which is located to the back side of the separation panel to the Storage-Ring control room. Sparkling snow flakes on his desk had welcome us on a violent morning.



Fig. 34 Dick Fasking : At his office desk ; He is sitting next to Charlie, but an opening on the panel is used for the entrance to the FFAG control room. So, he got busy traffics, however, he sits at the side of a sunny, good-view window.



Fig. 35 John Budden : An expert of electronics and Cross-word-puzzle. He had been at Yokosuka (Japanese Naval Base), at the end of Pacific War II.

Fig. 36 Derrel Klinke:
He is ready for everything ; so, he is working
for the government at
these days.

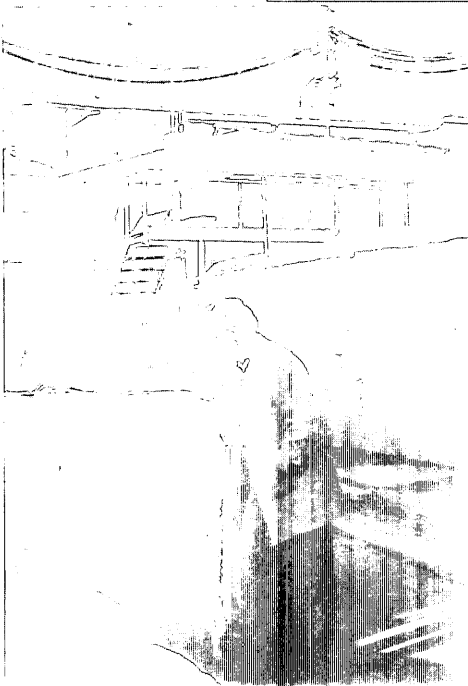
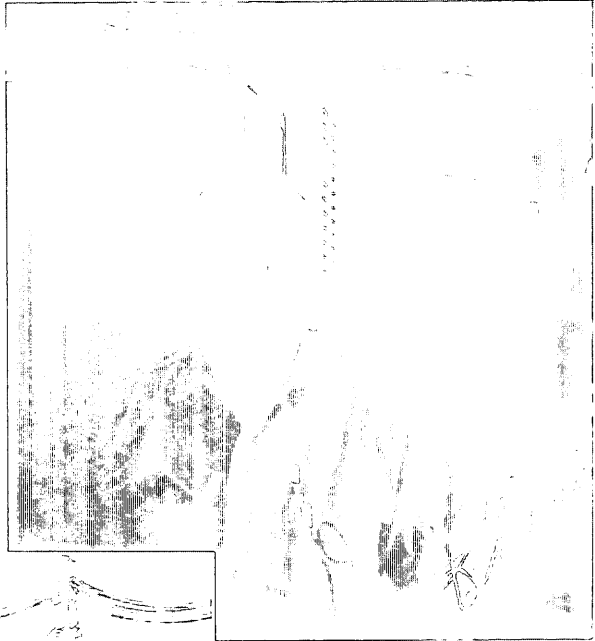


Fig. 37 William Scheifrey (Bill) :
He just got arrived with the sample
container, by driving his brand new
Dodge Dart, from UI. He preferred
this spot to take a picture. Be-
cause the yellow Warning Sign for
Radiation made him feel to be a
professional personel.



Fig. 38 Bob Bachrach : With his favorite cryostat and "Incubator" in PB (Physics Building, UI, Urbana), which purges moisture by dry Nitrogen gas, so that newly evaporated samples should be protected before they were carried to Stoughton for the experiments.



Fig. 39 Fred Brown : In his office in PB. (Urbana)

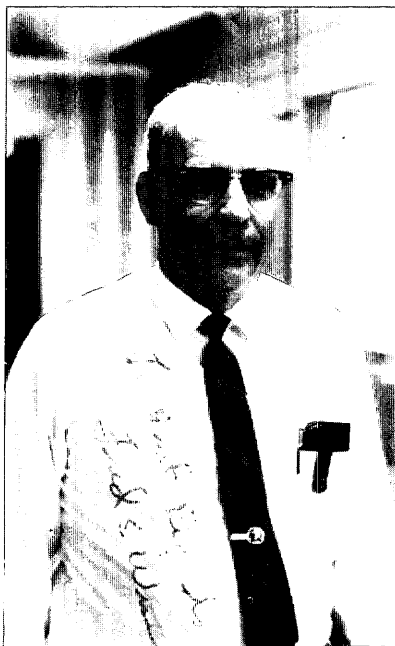


Fig. 40 Fred Wise : Director of machine shops, both PB and MRL. (Urbana) The same person who drove the Red Corn-Dump. (Fig. 24) He never asked me to slow down my "work order" requests. As a matter of fact, on last three months of 1967, the machine shop of MRL was "almost shut down" by the array of my "work-orders". This is because I requested to do every job in "Express", (that means to do the job on "1-A" bases, which might be three times more expensive than usual order) . So, at last, someone complained at my back in the MRL machine shop, that he could not get through the shop at all. I softly asked Fred Wise when we had happen to walk the corridor from MRL to PB ; "What should I do ?". Fred Wise simply answered "This is a GOOD THING !".

Fig. 41 Wayne Ddraig : Supervisor of MRL machine shop. To supervise means ; he had never said "We can't make such a thing !". Wayne always replied "We can make this, if you change your design at this point into such and such way ~". Everything ended up with simpler and far much better results ! Wayne asked me one day, if I could join a Poker-Table for the evening. I declined, since I did not know and worried about how much it would be for a Single BLUE-CHIP on his table. We, couple and a child, could live with \$20.00 for a week through the super-store, Eisner in Urbana. I couldn't lose 100 BUCKs just for a night. I still feel regret my absence to the invited table ; "I think I should react to the challenge ! Then, I might had got better understanding of the US people !"





Fig. 42 and Fig. 43 The last moment of the short period. "Who turned away ?!"
(Feb. 7, 1969, Fri ; Christian took the pictures, at the Ring-Side.)

§6 Merry Xmas To You !

1) Dec. 13, 1969. Fred.

Dear Hiizu,

Many thanks for your earlier letter. Christian also showed me your recent communication and it was also appreciated. We just returned yesterday from a week at Stoughton. It snowed and the temperature was about 10° F ! (-12.2° C) Our runs were fairly successful however and the machine operated well (at 1-10 ma) except for electronic problems on Friday. It's a difficult way to do an experiment.

Your comparison of the KI spectrum with Onodera's band results have spurred us to do a similar thing with Barry Kunz's calculation for KBr [Phys. Stat. Sol. 29, 115 (1968)] I have tested the selection rules and find the possible transitions to L_3' etc shown on the inclosed Xerox for two series shifted by the d-level spin-orbit splitting (calculated atomic value-also measured as in Bearden). The fit is quite remarkable.

.

One best regards go out to you and your family for Christmas.

Yours
Fred B.

UNIVERSITY OF ILLINOIS
DEPARTMENT OF PHYSICS
URBANA, ILLINOIS 61801

Dec. 13, 1969

Dear Heinz,

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Fig. 44 The first page of Fred's Christmas message, on December 13, 1969. You may read the analysis of the date is ending in these eight months.

2) Noël (Xmas) at Stoughton Downtown, in 1968.

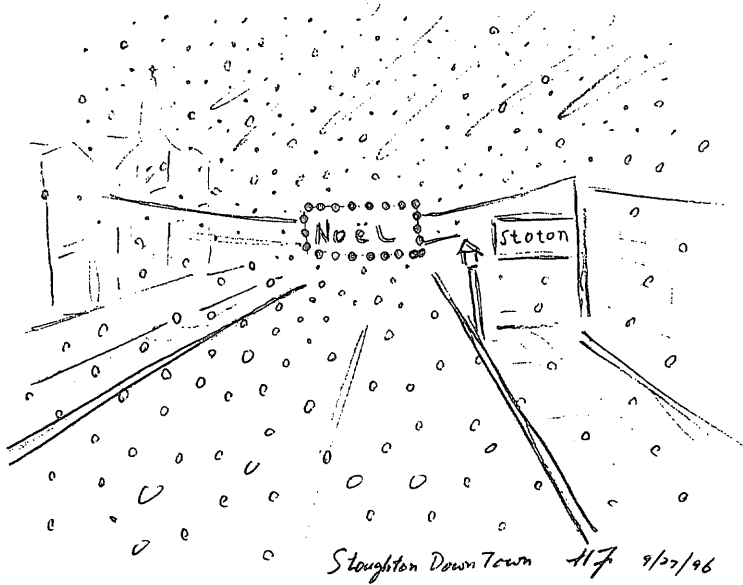


Fig. 45 Memory of the NOËL (White Xmas) in the Stoughton Down Town.
 "The STOTON RESTAURANT" was at the corner on the main street.

3) Nov. 18, 1974. Christian

Dear Hiizu,

I had a great pleasure to receive a letter from you this summer. I always like to remember our work together in Illinois, and somewhat the rememberings ("souvenirs") remain very alive despite the years of back-to-Europe-time which accumulated in between. Did you see the "cavern" picture of the storage ring on the cover page of physics-today (June or July). Even our machine was on it, recognizable even with the many transformations, but probably not connected to the ring. My heart was beating faster for a whole day! Also my boss, who is a very kind person, got interested to it

and warmed me up a little bit.

.....

We see more and more Japanese tourist in our country and I always hope to find you among them. I would really be pleased to see you again. Please give my kind regards to Mrs. Fujita and to your three sons.

Best regards,
Christian Gähwiler

p. s. I have not seen Fred this summer.

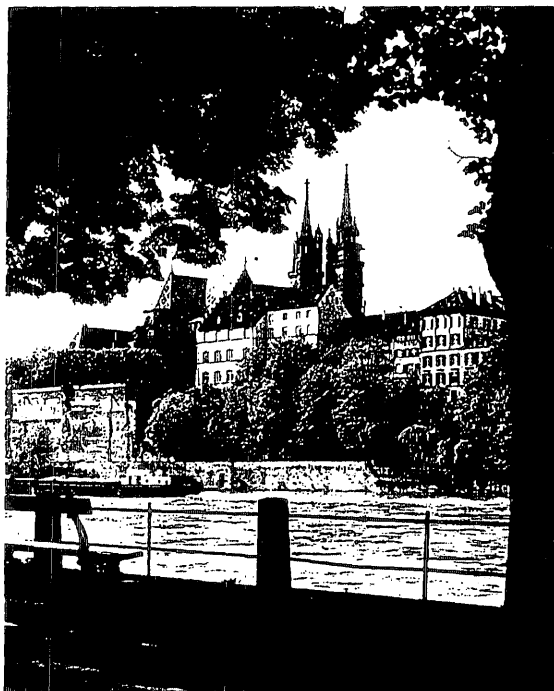
Gähwiler
Spitzackerstrasse 74
4103 Bottmingen

Nov. 18, 1974

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The world famous Swiss Biscuit



Basler Leckerli

Seit dem 14. Jahrhundert wird hier in Basel diese Biscuit-Spezialität hergestellt. Seit einer Zeit also, da man in Europa den Zucker noch nicht kannte. Dazumal brauchten unsere findigen Vorfahren Bienenhonig und süßten das Gebäck auf diese Weise. Vieles hat sich inzwischen geändert – doch das wohlbehütete Rezept ist geblieben. Wie vor 600 Jahren verwenden wir dieselben köstlichen Rohstoffe. Die Basler Leckerli müssen *hart* und knusprig sein. Man bricht die einzelnen Leckerli entzwei und läßt diese im Munde schmelzen. Nur so kann man das herrliche Aroma dieses unvergleichlichen Gebäcks voll genießen. Wer aber weichere Leckerli bevorzugt, lasse diese kurze Zeit an der Luft stehen.

Leckerli-Haus

Beim Barfüßerplatz, 4010 Basel

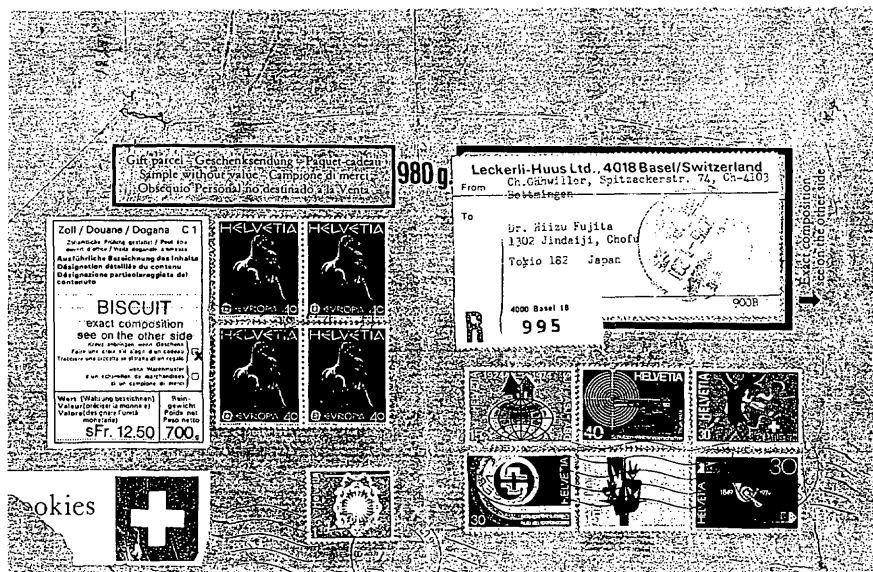


Fig. 46 The upper half of the first page of Christian's Christmas message, on November 18, 1974. He called my attention to look into the covering picture of the Storage Ring, which appeared on PHYSICS TODAY. Christian mailed me a can of Swiss Biscuits, which had a very sophisticated taste. I could not figure out how many spices were hidden within the recipe. Obviously, Swiss people are good at trading abroad. The can was specially designed for mailing ; thickness of the metal was thin but it was strong enough, beautifully plated. The biscuit was cut into "simple rectangular shape", so they were contained in a can by the closest packing form. This is the culture itself. Readers might enjoy the "Basel scenery" and the Stamps. I replied by some green-tea-bags. Biscuits came next year again !

4) Jan. 6, 1978. Mrs. Anna Kirk

Dear friends,

Reciept of your Christmas greetings and the generous inclosure made me very happy. It wouldn't be Christmas without one of your fine letter ! I will tell you a secret. You have the distinction of having retained your ability to write English the best of all the former English Class students. If I had been able to increase the number of class sessions per week, there'd have been time to teach writing English as well as comprehending and speaking it. I've found your narrative about the advice a professor gave your friend (who was about to depart to enter the University of Utah) very interesting. It made me wish I were still holding classes at Wesley ! Our morning session with three brilliant, Japanese professors were especially enjoyable. In retrospect, it seems a certain Professor Fujita who had a remarkable sense of humor kept us laughing. We have an idiom-"He kept us in stitches" that expresses the great laughter did reach. Another way to express it would be-"He caused us to laugh hilariously". Some people might think we were not as serious as students of a foreign language should be. But I believe our laughter caused relaxations that heightened our learning. I'm impressed by your pronounced appreciation.

.

Why don't you all come to visit me ?

Much love, Anna Kirk

1/6/78

Dear friends,
Receipt of your Christmas greetings and the generous inclosure made me very happy. It wouldn't be Christmas without one of your fine letters! I will tell you a secret. You have the distinction of having retained your ability to write English the best of all the former English Class students. If I had been able to increase the number of class sessions per week, there'd have been time to teach writing English as well as comprehending and speaking it. I've found your narrative about the advice a professor gave your friend (who was about to depart to enter the University of Utah) very interesting. It made me wish I were still holding classes at Wesley! Our morning sessions with these brilliant, Japanese professors were especially enjoyable. In retrospect, it seems a certain Professor Fujita who had a remarkable sense of humor kept us laughing. We have an idiom - "He kept us in stitches" that expresses that expresses the great degree the laughter did reach. Another way to express it would be - "He caused us to laugh hilariously". Some people might think we were not as serious as students of a foreign
..... at the But I believe

Fig. 47 Mrs. Anna Kirk's New Year's message ; 1/6/78.

- 5) Fig. 48 ; Mrs. Anna Kirk, in front of her house. (Champaign, Illinois)



- 6) Oct. 11, 1980. Charlie

Dear Hiizu,

I have good news ! Once again I am going to visit Japan. Like my visit in 1971 this one will be too short and too busy, but at least it may give me a chance to see you again.

The occasion of this visit is that I have been invited to participate in a joint US/Japan Seminar on Production and Application of High Power

Levels in the Extreme Ultraviolet which will be held in Sendai from October 27 to October 31. Since our own Users Group meeting will be October 20 and 21 and users stay around for a few days to discuss requirements and future plans, I will not be able to spend any time in Japan before the seminar.

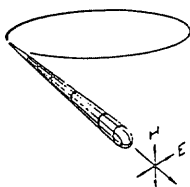
A group of us will arrive on Saturday October 25 and be met at the airport by Prof. Namioka who is the Japanese coordinator for the seminar. He will escort us to the Tokyo hotel (Shimbashi Dai-ichi). We will leave Tokyo by train at $\sim 10:00$ AM Sunday morning for Sendai.

After the seminar I plan to stop off at Nikko for a day of sightseeing and absorbing some small bit of Japanese culture. On Sunday morning I plan to come down from Nikko by train. I plan to spend the rest of Sunday, Monday, and Tuesday morning in Tokyo. Tuesday afternoon I plan to go up to the Photon Factory by train and sometime after noon on Wednesday Masakazu Aono, who is here at the SRC now but will be back in Japan after Oct. 1, will drive me to the airport at Narita.

I am sorry that I can't be more specific on time and on my hotel in Tokyo after the seminar. I had trouble making arrangements for trains and non-tourist type hotel from here so at last minute I turned that over to Prof. Namioka. He will have someone make train and hotel reservations for me. If I don't have a chance to talk to you while I am at the Shimbashi Dai-ichi on Oct. 25, leave a message where I could call you either during the following week or after I get back to Tokyo.

Sorry to give you such short notice of my trip. I am looking forward to seeing you again.

Charlie



Synchrotron Radiation Center University of Wisconsin-Madison

11/11/80

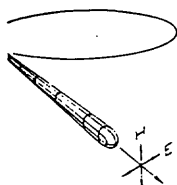
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Synchrotron Radiation Center University of Wisconsin-Madison

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Sorry to give you such short notice of my trip. I am looking forward to seeing you again.

Charlie

7) Dec. 1, 1986. Ed

Dear Hiizu,

I'm glad you got the invitation to the dedication Ceremony in time to be able to decline in such a gracefull way ! [I wrote I can't attend since I have classes on the day.] We who know you had a good laugh. And all send their regards. I'm sorry I have taken so long to answer your letters of this last year and to send the proceedings of the dedication-users' group meeting. It has been, and still is a busy time here. This is a poor excuse, but I just don't seem to have the energy I once had-its hard for me to believe that I will be 60 next October-but not being able to work the schedual that I do and have energy for anything else is a powerful argument that I really am getting on in age.

This last year has been an exciting one. In March we and our users group succeeded in convincing the NSF that they were foolish to kill an operating machine. In April I became a grand father. My oldest son, Andrew, and his wife produced a daughter that I finally got to see in November (they live in Texas) and I spent September in China. I was on Taiwan for two weeks and in the Peoples' Republic for another two weeks. I actually stopped at Narita comming and going, but the layovers were short and there was no way I could call. Sorry about that ! There is some chance that I will be comming your way again in the next yaer or two since I am now a consultant for the Taiwan S. R. machine project and an advisor for the peoples' Republic of China project at Hefei. There is also a very small chance that I will consult with Sumitomo Heavy Industries on microtrons, in which case visiting you would be easy. Well, becoming old and an elder stateman beats just becoming old !

Now some news of people you knew here, good and bad. Roger Otte who had a heart attack last year is completely recovered. Charly Pruett's wife

died after a long illness, but Charly remarried just this last weekend. Dick Fasking also remarried last summer. The other that you knew on the "Lonely Hill" are all well, tho many, over the years, have left for other jobs. However, John Budden is still with us. Finally, Tantalus will be turned off, after 18 years of faithful service, by the time you get this. However, we won't let him die : we have plans for him.

And how goes it with you, old friend ? I hope your studies of ancient Japanese Poetry (thank you for the translation you sent me last year-it was very much to the point) and your work on the history of the semiconductor development in Japan are proceeding and giving you pleasure. I also hope that all is well with you and your family - please give my regards to all of them.

May this next year be a season of peace, tranquility and satisfaction for you.

p.s. a word of explanation about the Users Group meeting. Morton M. Traum was on of the Bell Laboratories group that worked at Tantalus. He died, at Tantalus, of a massive coronary attack four years ago. He was much respected and loved by his colleagues. We miss him yet. He was just 40 years old and at the peak of his carreer.

There is an old Jewish proverb : The good die young that they not be corrupted ; the evil live long that they may repent. If this is true, I'll probably live to be 1000.

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 corrupted; the evil live long that they
 may repent. If this is true, I'll probably
 live to be 1000.

Fig. 50 The last page of Ed's Christmas message; December 1, 1986. On the final lines we read, "The good die young that they not be corrupted; the evil live long that they may repent. If this is true, I'll probably live to be 1000." To be sad; Ed was NOT HALF BAD!

8) March 10, 1987. Fred

Dear Hiizu,

Your very good photographs arrived this week. I am very pleased to have them as a record of my trip. I also want to thank you for all the trouble and expense you went to in connection with my visit. It was good to see you and to travel together to Okazaki. I am only sorry that it came at a difficult time for you—also that you caught cold upon returning. I trust you are feeling better now.

The conference was excellent at the IMS. That Institute is kind of a "show place"—more it likely will develop into a first rate activity. It would be an interesting place to spend more time. In my own case I regret that my visit was so short.

The trip back to ETL on Sunday went without real difficulty. Dr. Isao Suzuki met me at the Tokyo station as planned. I did catch an earlier train for Toyohashi-one which turned off- so I waited at an intermediate stop for the next connection to Toyohashi. Then caught the Kodama (Shinkansen line) as planned.

From Tsukuba to Narita was also an interesting adventure. I managed this on my own without a "hitch" by changing trains at Abiko-then a local bus at Narita to the airport. Clearly it helps to recognize some Kanji characters-in fact I would like to study someday and perhaps make more than a casual visit. It really made me feel stupid not knowing more about the language.

The ETL and photon factory were most impressive. Especially there seems to be a great deal of interaction with Industry on X-ray lithography etc.

Upon my return I went up to Aladdin to install new entrance slits (heat sunk and cooled) in the ERG. They seem to work OK, and this week Gary Mason and Gary Kwawer are beginning new photoemission experiments on AgBr (prepared in situ). A current picture of the ring is inclosed.

I asked Ed Rowe about your section of the Tantalus vacuum chamber. It seems Murray Thompson (the old guy who used to seen PSL) threw it out last year. We are however working on it and may find other parts.

I also inclose a "map" of Whidbey Island. ● marks the spot of our house at Useless Bay. It is only 15 min. to the mainland by ferry from Clinton. Therefore Seattle is close.
Thanks again for everything.

Best regards,
Fred

Note : the 28th Okazaki Conference on "Solid State Chemistry with VUV Synchrotron Radiation" was held at the Institute of Molecular Science, Okazaki, Japan, on February 6, 1987.

Fred's title is ;

"Defect Formation In Ionic Solids By Vacuum Ultraviolet Synchrotron Radiation" presented from-Department of Physics, University of Illinois, Urbana, Illinois.



Fig. 51 Fred is waiting for the "Bullet Train" for Okazaki, at Tokyo Station. Fred attended The 28th Okazaki Conference on "Solid State Chemistry with UV Synchrotron Radiation", on February 6, 1987.



Fig. 52 Fred met with Prof. Hiro'o Inokuti, Head of The Institute of Molecular Science (IMS).



Fig. 53 Fred was served with the Emeritus Professor's Office in IMS to work.

§7 Requiem

Mr. John Budden's beautifully printed letter came in, on July 12, 1996. On the second line, I saw the words that I mostly didn't want to read ! "Ed Rowe died on July 4th 1996." On the next line, there was the mostly unkindest statement ! "He had broken his hip in a fall at the Aladdin".

I felt my blood were got frozen up in my Brain ! What on earth he was doing around Aladdin ? He was supposed to be busy for packing Tantalus, didn't he ? Did anyone of youngsters of these days not aware that the most fatal thing for the old is to fall ? Just come over and look at the inside of a hospital of this island ! Innumerable silvergray heads are nailed down to pillows. Once the old were staggered and fell down, his (her) bones will be so easily broken ! And he (she) will never be able to get out of bed. Since it's almost impossible to call for calcium for the broken part.

The numeral sixty may have deeper meanings than we think. How many seconds make a minute ? How many minutes make an hour ? How long can mankind be alive, then ? Sixty. Japanese have an old counting system for ages. You may heard about the "age of dog, age of sheep etc". The system ends at the age of sixty ! How can we manage over sixty, if we happen to alive ? We restart from the beginning ; age of one plus sixty. We celebrate, and you do also, when a man got the age of sixty. We know the reasons, but you may not know why. The odometer for a man comes to the scroll-end at sixty. We are very much alike to used-cars. You may wonder to notice that ancient people had quite a long life ; more than one hundred ! Studies of an ancient history of Japan opened a thrilling story ; they got two-ages for a Year ! The change of the counting system means that

UW scientist Ednor Rowe dies

Structure of matter key area of interest

By Vincent Filak

Wisconsin State Journal

Ednor Rowe, who gave scientists around the world a better method to probe the structure of matter, died Thursday at his McFarland home after a long illness.

"Ed was a gem — an absolutely brilliant scientist," UW-Madison Provost John Wiley said in a press release. "He's going to be deeply missed here and at synchrotron radiation facilities around the world."

Rowe, 68, made fundamental discoveries possible in the semiconductor and microelectronics fields and is considered the father of synchrotron radiation.

Synchrotron radiation is light created when electrons spin around a storage ring at nearly the speed of light.

While others considered the radiation to be an unwanted byproduct of particle research, Rowe saw how scientists could use the light in a variety of material studies.

Rowe was the first in the world to design a research facility dedicated to using the intense light produced from electron storage rings. Rowe led the development

of the Synchrotron Radiation Center in the late 1960s and was its associate director.

The SRC, on UW-Madison's Kegonsa research campus south of Madison, became a model for similar facilities across the world.

In the 28 years since its creation, users of the SRC have produced more than 2,000 scientific papers on everything from structures of exotic materials to etching more intricate computer chips.

In 1967-68, Rowe created the first UW-Madison electron storage ring, called Tantalus. The ring was replaced in 1985 by a larger storage ring named Aladdin, which Rowe also helped design.

SRC Director David Huber said Rowe was preparing Tantalus for shipment to the Smithsonian Institution.

Rowe is survived by his wife, Lenore, and four children.



Rowe

Fig. 54 "Wisconsin State Journal, Saturday, July 6, 1996"; which reported the Ed's sad news.

the different culture took over the place. It must be an invasion.

You all know well that the Declaration of Independence were decided to be composed by a Congress committee. Thomas Jefferson and Benjamin Franklin were the members ; very famous. Tell me ; where were Mr. Benjamin Franklin when people were dancing for joy ? He was appointed as the Ambassador and arrived at PARIS ! He, Benjamin Franklin, Stayed there for the duty until 1785. In what year George Washington and His Army got to stay over in the cold winter at Valley Forge ? Yes, 1777 ~ 78, you know well ! But, do you happen to know what happened on 1778 at the Valley ? French Army arrived, with plenty of ammunitions, K-rations, and maybe with spleepng bags ! Why ? Mr. Benjamin Franklin got succeeded in to make the United-Treaty between US (?) and France. Who, do you guess, signed the order to "Send His Army across the Border without to be Attacked" ? Louis X VI ! You know his name more than well, together with his spouse —Marie-Antoinette. What I am saying is that Every nation has his Myth. Japan of course has plenty of it, I am affraid. However, you've got one-sided story after the French-Indian War. You may not be able to imagine my relaxed sense when I noticed the Big-Decolation over the Main-Street of Stoughton, which reads "NOËL !"

Back to my point, I want to point out that French has the same counting system as the old Chinese one. It goes up by the decimals upto sixty (soixante). They switch to the old 60 cycle. They begin with 60 plus 1 (soixante et un). But When they come up to 80, again they switch to another system ; 4 times 20 (quatre-vingts). As I told, this might be related to the ancient human knowledge.

My never-ending regret is that I should have warned Ed, when he wrote me he would become age of sixty. Japanese old folks are easily stagger at even 1/8" step at the carpet end on the floor. Their bones are so fragile

that break into pieces even when they fell onto such a soft floor as Tatami-mattress ! This is the reality to be old ! But look at those mall rats or yougstaers who are rushing down the staires of traffic stations, almost elbowing aside the old folks ! We lost the War in 1945 ; sure ! But we are losing Culture in 1996 ; more serious ! At the same time, I noticed, to be sad, US is losing to set up American New Culture after 1945 ! Both nations got heavily dented by the War. Can we eligible for exchanging funny arguments on Pearl and Hiroshima at Smithsonian ? What do you think ? See what I mean ? No ? Then, why don't you look at the floor of Aladdin ?

I know quite well, that the US Lab is much more NEAT and CLEAN compaired to the Japanese one. The most terrible places are in National University Labs. They are dwelling in the Nest of Rats and/or Spallows ! I felt quite a danger when Ed climed up a ladder at INSSOR, Tokyo University. He wanted to get inside of the daughnut. But, Aladdin picture he gave me shows there are so many cables and metal angles snake around on the floor ! That is not the place for an old man over age of sixty should work !

You didn't feel anything strange when you saw Ed's white beard ! When he did show up in 1978, I got quite a shock to perceive his beard was changing into salt ! We made a long way of driving, up and down on the island ; from Tokyo to Sendai, then from Sendai to Okazaki, and again back to Tokyo (Fig. 55). We talked quite a lot. I digged into the subjects, boldly, that no diplomat may even think to ask. Ed Rowe never avoided nor circumvented the answer. I don't know if I'd disclose our conversations, since I cannot call any witness. We were only two.

It began at the night before we start to Sendai next morning, in his room at Hotel New Ohtani : "What if I moved to US to be a citizen ?" "You will

* added on 8/3/78

To go (Ed Rowe's Ali'i Table to PSL) No. _____

[illegible]

Fig. 55 Ed's "Alibi Table" in Japan ; Ed attended the International Conference in Sendai, August 29~September 1, 1978. We made a long up- and-down driving trip to Okazaki, after the conference. I talked to Ed, so that he should keep the solid "Alibi Table" for a possible Coup d'Etat, or Sherlock Holmes, in somewhere unknown. Since, he was obviously climbed up to the Top of The Tree, named Aladdin Project. (I was half serious, but half kidding.)

get very poor retirement !” “How much for example ?” “I don’t know. But how many kids do you have ?” “Three” “You can’t afford to let’em all go to Universities. Education costs are very high” “Many Japanese in Madison ?” “No, I don’t think so.” “Why ?” “Simply, they didn’t come. Maybe it’s too chilly for them”

We stopped at a rest area, near Nasu, next noon (Fig. 56). Picking up some sandwiches, Ed began : “You put your weight, Hiizu, that’s no good” “Yeah, but I quit cigaret, and you increased. That’s no good, too !” “Yeah. We are gettin-on-and-on-and-on !” “You feel home sick ?” “No, not exactly, but I want to go back as fast as I can” “Why ?” “Aladdin will be collapsed down if I may be absent too long. STOMP !” “Because ?” “Nobody knows how to do it !” “You’r worrying a coup-d’ etat ?” “No, not at all.” “But, I must take you to Okazaki. It’s a date.” “Yeah, yeah, I know.” We dined at Mt. Fuji-Hotel on the way go and back. The days were perfect and Mt. Fuji was in front of us. “Do you come to this place frequently ?” “No. For what the sake ?”

Whenever discussions became delicate and serious, we made small stops. The names of the coffee shops or restaurants of which, I’ve forgot. In front of our table, there were parking lots at a coffee shop. A girl driver repeatedly tried to let her car back-in. Ed smiled a bit, and said “Perfectionist is everywhere !” Yes, I knew I was a kind of it. But, I was tired to live in this “society of many-body problem with strong interactions !” I wished seriously to change my career. But no way to get out was to be seen ! We were never aware that the heaviest blow might hit each of us, pri-son !

For my side, RCA Tokyo was suddenly closed on January 1982. I was unhappy, naturally, to lose my job. However, I felt a sort of tranquility, because I did not need to feel any pain of LEAVING ! All was just Gone with the Wind !



Fig. 56 Ed at the Nasu-Kogen rest area, on Tohoku High-Way : August 29, 1978.

I found the numerous university "Friends" were all useless, and unreliable. They might had been convincing that they had a special Right, Status, or Ability, which deserved to be Fedded by me, or by Public ! They have no sense, nor power, no ability to feed me, when I need it most. They turned out to be simple Cultural Proletaliates ; "They have nothing to lose, Even a Chain !"

After some Touch-and-Goes, I went up again into the "Yonder Blue !" I did not look back Sodom, neither Inhabitants therein. I recalled the first comment, the Ex-President of RCA Tokyo Lab, Dr. Philip K. Baltzer gave me, when I met with him at the Interview : "Don't look back any more ! I'm 100% standing behind you !" And, I recognized "Who is Ashes, and who is Diamond."

Ed Rowe visited the IMS (Institute for Molecular Science). He gave a

talk on Microtron, and later looked over the expected place for the new light source.



Fig. 57 Ed in IMS, talking with Prof. Hiro'o Inokuti. Prof. Inokuti frequently asked me to focus on Ed, not on himself.



Fig. 58 Ed was figuring the planned area for the New Storage Ring Light Source. It was constructed under-ground of the planned area, and covered by the tennis courtyards. From left to right, Prof. Inokuti, next but one, Ed, and Prof. Akamatu, the President of IMS. (The author's feeling was that Prof. Akamatu and Inokuti were coming to the conclusion, "Almost but not Quite" to construct the machine. It seemed, however, they needed the last straw to decide their balance, 100%.

Prof. Inokuti says he should put a Special Chapter for Ed's visit in his "Memoire on UV-SOR", [Synchrotron Orbit Radiation] : Well, we will see !)



Fig. 59 We left the cite, and going back to the Lab. ; (from left to right : Fujita, Ed Rowe, Prof. Akamatu, and Prof. Inokuti. [Notice that, Prof. Inokuti was walking about three feet behind Prof. Akamatu ! This is because, well educated personnels of his generation were taught that "You should not step on your Teacher's Shadow, if you respect your Teacher !" (Beautiful ! But, Japan is really complicated, hard to understand, delicate, fragile, and dangerous country, isn't it ?)



Fig. 60 Ed and myself stopped off at Okazaki Castle, on next morning (Sep. 9, 1978). Too bad, it was too early, about 8 : 00 am, and the Gate of the Castle Tower was not opened yet. [入口] means the Entrance, [出口] means the Exit : Fig. 61.



Fig. 61

Ed Rowe's Xmas Card :

12-16-84

Dear Hiizu,

Your card with all the news came and for that many thanks. You deal with difficulty much better than I. This past two years has been very difficult for me ; so much so that last year I sent no season's greetings to anyone. Alladin continues to work very poorly-only two mA at full energy. As you probably know, I was removed as director a year ago. I stayed on at the request of the University Chancellor, tho I probably would have any how-a man should finish what he starts, if he can. Its not such a bad life (they raised my salary to help me make up my mind to stay) but it still hurt.

The National Science Foundation was severely critisized for under funding the project with the result that the support was increased by a factor of three, but someone had to be the villain-me ! So my head was the one that was chopped off. I suppose that I can take some pride in the fact that it took three people to replace me : a director and two associate directors !

Now since the "experts" can't invent a reason for our difficulties, they conclude that we should inject at 800 MeV and a committee is studying the possibility of installing an 800 MeV synchrotron for that purpose. It is estimated that this will cost about \$ 10, 000, 000 over the next three years. That's over twice as much as Alladin has cost todate. This project will probably go ahead.

In retrospect I wonder if maybe I should have taken Huke's offer-the Photon Factory does work and that's more than you say about the three new machines here in the U. S.

However, then I would have had to abandon Aladdin and, more important, my colleagues.

Fortunately, during all of this disruption the "light under the windy hill" continues to work faithfully and the research teams have been very productive.

As I look back on the past years I think I should be satisfied and content to sit in the sun like an old soldier watching the battle from afar, remembering past glories. But I can still hear the bugles and drums.

Well, enough of all this. My children seem to be getting along well. Sarah is doing well at the University-the only one who did. The boys, I fear, are not scholars. But perhaps one day they will get themselves organized.

Fred Brown is active again at the windy hill-he hasn't changed much over the years. Charlie, Roger and Dick are well and active as is John Budden. There are now many new faces at the Radiation Center and the Radiation Center is no longer a part of the Physical Sciences Laboratory. We are still part of the university but independent.

Well old frind, I wish you and your family well for this next year-If your studies of 7th Century Poetry ever result in a paper in English, I would be

interested in reading it.

All the best to you,

Ed

宇都里由久 時 見 其登尔 許己呂伊多久
 ウツリユク トキミル ゴトニ ココロイタク
 牟可之能 比等之 於毛保由流加母
 ムカシノ ヒトシ オモホユルカモ
 【萬葉集・4483・大伴家持】

Whenever I see the time is slipping away,
 My heart and soul get aches and hurts, and,
 Friend's memories appear to me in a vision.
 [Ten-Thousands Leaves • No. 4483, by Yakamochi OHTOMO]

“C' est tout ?”

“Mais non !”

“Continue. J' écoute et J' entends bien !”

“Merci ! Mais, Je suis très fatiguée ! ---

--- Donne moi l' Intermission, s' il te plait !”

“D' accord ! Je comprends.”

『Intermission : September 26, 1996. Hiizu Fujita』

§8 CURTAIN SPEECH

La mémoire du village :

Mesdemoiselles, Mesdames et Messieurs ! Je vous présente madame Sarah Rowe-Kreft. Elle était fille de la maison, Ed Rowe. Je crois, elle a quelque chose à vous dire un peu ses impressions. Sarah !...

Sarah :

We spent our first Christmas without my dad, which was sad. Going through his things, I found many old pictures, including slide-photos of your trip to our house in 1972 (?). I made a slide-show of all his old pictures for our family and we watched it together on Christmas. We also saw your funny letter to him with all your old photos from the 1960's - early 1970's. It's like a time capsule to see him looking so young.

As you probably know, his lab is being named after him. He would have been very happy about that. We did put "Father of Synchrotron Radiation" on his monument. He is buried in a beautiful old graveyard with lots of 200 year old oak trees shading it.

Our family is doing well-my husband and I moved back to McFarland after my dad got sick. So we could visit him more often, and we bought a house a 5 minute walk from my mom's house on the lake. We see a lot of her, and are able to help her house.

I hope you and your family are doing well.

Best wishes for the new year

Sarah Rowe and family 12/28/96

La mémoire du village : C'est très bien !



ED ROWE'S MANUSCRIPT :

From the left :

Leni, Twyla (William's friend),
Lori (Robert's wife),
Andrew (Andy), Robert, Dr. Rowe,
Sarah, William.

It was the first time
I ever wore cap and gown.

From the left :

*Leni, Twyla (William's
friend), Lori (Robert's wife),
andrew, Robert, Dr. Rowe,
Sarah, William.*

*It was the first time
I ever wore cap and
gown.*



SARAH

WILLIE

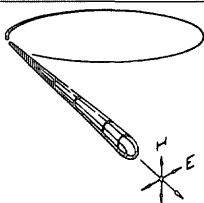


[CAST]

Sarah Rowe - Kreft : 3524 Orvold Park Dr., McFarland, WI 53558
Charles H. Pruett : 3325 Westview Lane, Madison WI 53713
John Budden : 1417 Furseth Road, Stoughton, WI 53589-1074
Richard C. Fasking : 6000 Sylvan Lane, Madison, WI 53716
Roger Otte : 5519 Milwaukee Street, McFarland, WI 53558
Darrell Klink : 355 Kennedy Drive, Oregon WI 53575
David L. Huber : 3731 Schneider Drive, Stoughton, WI 53589-3097,
SRC (Director)
Frederick C. Brown : 2414 E Discovery Pl, Langley, WA 98260
Christian Gähwiler : Spitzackerstrasse, 74 CH-4103 Bottmingen,
SWITZERLAND
Robert Z. Bachrach : 3050 Bowers Avenue. Santa Clara, CA 95054
APPLIED MATERIALS (Director of Technolrgy)
Hiizu Fujita : 6-39-12 Jindaiji-Higashi, Chofu, Tokyo 182, Japan

À une prochaine ! Le bonheur c'est pour la vie ! [1/12/97 (Sun) HF]

Appendix



Synchrotron Radiation Center

University of Wisconsin-Madison

3731 Schneider Drive, Stoughton, WI 53589-3097
608/877-2000 Phone 608/877-2001 FAX

April 7, 1994

Dr. Hiizu Fujita
6-39-12 Jindaiji-Higashi
Chofu, Tokyo 182
Japan

Dear Hiizu:

Tantalus, the first electron storage ring dedicated to synchrotron radiation research, was retired from regular operations at the SRC on December 5, 1986, after eighteen very productive and exciting years starting when the first data was taken with it by Dr. Ulrich Gerhardt in August of 1968. Since 1986, Tantalus has been used, occasionally, by members of the SRC User Group for special applications. The last such use was by members of Dr. James A.R. Samson's group from the University of Nebraska, in 1987. Since then, even though Tantalus has been maintained and operated regularly since 1987, there has been no further interest in using it for research, and the Tantalus facility has become a storage area for the SRC and its Users.

Recently, the Dean of the Graduate School of the University of Wisconsin-Madison, the university unit that the SRC is a part of, requested that we make space in the Tantalus facility available to research programs from the Madison campus that can make use of its unique capabilities, provided that we have no new programs for Tantalus ourselves. At the present time, funding for new programs seems very unlikely, and without funding there can be no new programs.

Thus, we are left with 2 alternatives: to give Tantalus away or to scrap it. The scrap heap seems a sorry end for such a historic and productive machine. There has been interest expressed by some third world countries in acquiring it, but the SRC would probably have to bear the cost of dismantling, shipping, and reassembly. If we could afford that we could afford to upgrade the machine so that we could use it for accelerator research ourselves!

Our preference is to donate Tantalus to a museum. Contact has been made with Dr. Paul Forman, Curator of Modern Physics at the Smithsonian Institution, and his response has been encouraging. We are now gathering together drawings, photos, and such written material as we can for his consideration. There is, however, one area that we are not qualified to cover. Dr. Forman has asked us to provide a list of the most significant researches, achievements, and/or developments that were carried out with Tantalus during the years of its operation as a photon source. These should be works that would have been difficult or impossible without access to a dedicated electron storage ring synchrotron radiation source.

Dr. Hiizu Fujita
March 31, 1994
Page 2

You, as a User of Tantalus, or as a non-User familiar with the researches carried out with it, in the 1968-1986 period before Aladdin became available for synchrotron radiation research at SRC, could be of great assistance to us in our effort to make the case for putting Tantalus into the Smithsonian by helping us to prepare this list. We need to hear from you what, in your opinion, are the most significant accomplishments of our User Group during this period. You don't need to be exhaustive in your efforts since this letter is being sent to the Tantalus Users, and those non-User most familiar with it, with the widest range of research interests possible. Hence, there should be a high probability that very little of importance will be missed in the total response.

If you wish to participate in this effort, please send your "nominations" to me at the SRC by Mail or FAX by June 31, 1994, and indicate if you are willing to let us reproduce your letter in whole or in part for the purpose stated here.

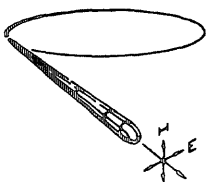
Thank you for your patience and your attention to this matter.

Sincerely,



Ednor M. Rowe
Associate Director, Accelerator Development

EMR:pl



Synchrotron Radiation Center University of Wisconsin-Madison

3731 Schneider Drive, Stoughton, WI 53589-3097

Phone: 608-877-2000 FAX: 608-877-2001

February 14, 1995

Dr. Hiizu Fujita
6-39-12 Jindaiji
Higashi
Chofu-City Tokyo 182
Japan

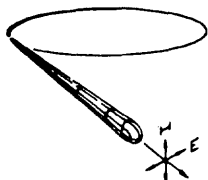
Hiizu
Dear Dr. Fujita,

Thank you for your response to my letter of July 25, 1994, requesting your views on the subject of the preservation of Tantalus at the Smithsonian Institution. Altogether, there were 16 responses. It appears that these, and the documentary material that I was able to find in the PSL and SRC files, were adequate for the purpose. On January 20, 1995 I received a letter from Dr. Paul Forman, Curator for Modern Physics of the National Museum of American History, advising me that the museum has authorized the acquisition of Tantalus and Fred Brown's original beamline for preservation. For your information, I have included a copy of this letter. In addition, sources of funds to cover the costs of packing and shipping Tantalus and the beamline to the Smithsonian have been found. Dr. Forman and a member of his staff will visit the SRC on the 24th of April 1995 to inspect Tantalus, the beamline, and the available documentation.

It is possible that at other, later, Synchrotron Radiation facilities, the work that you did here in those old days may have since been done better, but there is little doubt that you did it here first. I have always thought that the real heroes of that era were the Users. You abandoned your comfortable, home laboratories, traveled great distances (in some instances internationally!), to the inhospitable northland to use a sometimes unpredictable, cranky machine that was buried in a dingy, uncomfortable hole in the ground, and there produced an incredible amount of first rate science. In addition, you, literally, showed the VUV Physics and Photo Emission Communities "how to do it". If credit is due, it is due to you. I thank you all for allowing me, and the SRC staff to participate in your marvelous accomplishment.

Sincerely,

Ednor Rowe
Associate Director for
Accelerator Development



Synchrotron Radiation Center

University of Wisconsin-Madison

3731 Schneider Drive, Stoughton, WI 53589-3097

Phone: 608-877-2000 FAX: 608-877-2001

February 21, 1995

Dr. Hiizu Fujita
6-39-12 Jindaiji
Higashi
Chofu-City Tokyo 182
Japan

Hiizu
Dear Dr. Fujita,

Due to an oversight on our part, we forgot to include the letter I received from Dr. Paul Forman on January 20, 1995, curator for Modern Physics of the National Museum of American History advising me that the museum has authorized the acquisition of Tantalus and Fred Brown's original beamline for preservation. Please find that letter enclosed. Sorry for any inconvenience.

Sincerely,

Ed Rowe

Ednor Rowe
Associate Director for
Accelerator Development

NATIONAL MUSEUM OF AMERICAN HISTORY

SCIENCE, TECHNOLOGY, AND CULTURE

1995 Jan. 12

Dr Ednor M. Rowe
Synchrotron Radiation Center
University of Wisconsin - Madison

Dear Ed,

I'm very pleased to tell you that this museum has authorized the acquisition of approximately one half of the Tantalus electron storage ring / synchrotron light source, along with the extant early 'beam line' and associated apparatus, and a substantial quantity of documentation of design, construction, and operation of the device.

To this end the museum has also authorized the expenditure of up to five thousand dollars for costs associated with the disassembly, crating and transportation of Tantalus, but has expressed the hope that its very limited funds will be spared and supplemented as far as possible by the Center and the University.

In particular, although we conceive that Tantalus will occupy an important place in any future scopeful exhibit on particle accelerators that this museum may prepare, we must also realistically reckon that the acquired hardware will be placed in storage, and may well remain so for a considerable time. For this reason it is important that it all be crated securely and in such a way as to protect the instrument from dust. This will require some investment of materials and, especially, of labor, which we hope that you will be able to find some way to cover.

To E.M. Rowe, 1995.1.12

p. 2

It would be advantageous for me, and perhaps also my assistant, Mr Roger Sherman, to visit Madison to consider with you just what portions of Tantalus to take, how to divide it up for crating, and also to look over the available documentation and discuss what of it you may be willing to let go to the Archives Center of this museum.

That in this way we may have the opportunity to make your personal acquaintance, and that of your coworkers in and around synchrotron light, is an added incentive. Thank you again for all your work to help us discover and demonstrate how important and pretty Tantalus is.

Yours sincerely,

A handwritten signature in cursive script, reading "Paul Forman".

Dr Paul Forman

Curator for modern physics