

~~Scout~~

## SJSC Writings 1964-65

- Entropy Letter ~ 1964
- Coop Engineering Report to  
U. S. Steel, Pittsburg  
9-16-1964
- Metallurgy draft Fiction ~ 1964
- Essay Fiction 'Searching'  
12-18-1964
- 'Career' Statement ~ 1964-65
- Essay 'A MAN' ~ early 1965
- Essay 'This I Believe' 11-16-64
- Book Blurb: The Solution  
~ 64-65
- " Idea: The Structure  
Breakers - H<sub>2</sub>O  
draft outline, notes

SJSU ~ 1964

Editor:

Mr. Kim Maxwell recently picketed the Navy van on Seventh Street bearing a sign proclaiming: "The Military Maximizes Entropy." We would like to correct Mr. Maxwell's entropological misconception.

A military society imposes specific rules of selection and order. Therefore, in direct opposition to Mr. Maxwell's statement, the military cannot maximize Entropy. Perhaps Mr. Maxwell was referring to the effects of active militarism, i.e., war. A rigorous exposition of the Entropy of War would unfortunately run over our 300 word limit.

For those who wish a thorough understanding of Entropy, we particularly recommend:

Franklin Durham, Thermodynamics, p. 31;

for a less sophisticated treatment of the concept, see

A. D'Abro, The Rise of the New Physics, v.2.

*Neil Beckley*

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SJSC Coop  
Engineering  
Program Fall, 1964

Pittsburg Works  
Metallurgy & Inspection Dept.  
September 16, 1964

To: Mr. H. F. Stout  
From: Mr. J. D. Andrade  
Subject: Summer Trainee Final Report - 1964

Attached is a copy of my final report in the  
June 8 - September 16, 1964 summer trainee period. I  
hope it meets with your approval.

The report is somewhat unorthodox in both approach  
and language. It is written informally and honestly. It is  
informal because an informal approach is generally much more  
readable and useful than a formal approach. Formal reports  
tend to be completely ignored or at best skimmed over by most  
of their readers. My report is informal and straight forward -  
I am confident it will be read.

The summer has been interesting, challenging, and  
responsible. My assignments and duties have been on the level  
I hoped for but never really expected. It has been a most  
worthwhile and enjoyable 14 weeks.

Thank You.

*J. D. Andrade*  
J. D. Andrade

cc: H. F. Stout (Attachment)  
D. C. Wilde "  
A. G. Esparza "  
G. F. Switzer "  
J. P. Newman "  
E. L. Slagle "  
H. E. Doleman "

UNITED STATES STEEL CORPORATION  
PITTSBURG WORKS

Metallurgy & Inspection Dept.  
September 16, 1964

Summer Trainee Report - 1964  
by J. D. Andrade

I. ASSIGNMENT

To observe, study, and become familiar with the Morgan Rod Mill operation, from beginning to end, with particular emphasis on product quality, and to make various recommendations for an improved product.

II. INTRODUCTION

This summer report begins on June 8, 1964 - the date that one naive, young, broke, and eager student was employed by PITTSBURG WORKS. Under the correct assumption that U. S. Steel is not a welfare agency, with the possible exception of a few jobs, this naive youngster was braced for a summer of suicide - inducing metallographic sample preparation. That summer has never existed. The summer that has existed has been an entirely different and, frankly, an unexpected and enjoyable one.

I have been lucky enough to work in a department which has been understaffed and in a period of transition. This has led to what I feel have been responsible and important assignments, with time remaining for the execution of my general summer project.

This report deals only with that general assignment, which is actually quite involved. My observations of current practices and recommendations for improvements are included. Some of the changes have already been made, many practices are in the process of being changed, and some recommendations are probably erroneous and should never be instituted.

All who read this should be aware of the inherent limitations in recommendations made by a green, idealistic student. Three months is a very short time, especially in comparison with 20 or 30 years of job experience. The idealism and lack of experience inherent in many of these recommendations should be considered when evaluating them.

Being basically an optimistic type (even though I'm of draft age), I want to make it clear that there are many advantages in an unexperienced, green individual's recommendations. He is not burdened by the routine and possibly "rut" that more experienced people could be afflicted with. This should lead to a fresh, independent, creative approach to various problems.

The people I have worked with have been inspiring, exciting, helpful, eager, knowledgeable, and sexy (the secretaries). They have all been very eager to help and answer questions. Park Thompson's tours and explanations are unbelievable - when he answers a question or explains an operation, you feel that you really understand it. This is a rare and wonderful trait. The mill personnel have been very eager to help and explain their jobs. There were many instances where I was wandering in the mill looking stupid and a nearby operator would wave me over and begin explaining his operation.

The recommendations in this report are not all original. Many of them have been derived from conversations and discussions with many people, both in M & I and Operating; primarily with Mr. Alex Esparza and Mr. Walter Knight of M & I.

The recommendations are based on my experience up to this particular moment. Another week or another month of experience might and probably would modify, if not completely change, many of my recommendations. They are what I would do now if I were in sole charge.

The success of the Morgan Rod Mill operation is completely dependent on two functions disconnected from the actual heating and rolling - billet inspection and rod inspection. These two functions have dominated my time and efforts this summer. I have consolidated all Rod Mill observations and recommendations not directly concerned with billet or rod inspection under the heading of Rolling Operations. Some recommendations for the Wire Mill and M & I are also included.

I have not included an extensive evaluation of the Summer Trainee program or a summary of the report. I have been evaluating the program all summer with many people and it is quite obvious that I've been very happy with it. Summaries tend to be read while the reports they summarize are not defeating the purpose of a summary. The report is concluded with some informal final comments.

### III. Billet Inspection and Conditioning

Billet inspection and conditioning practices at Pittsburgh Works are non-existent. Standard practices exist and are employed for Pittsburgh steel, but they do not exist for "outside" steel. The advent of the Fairless source of exclusive steel supply left this mill without billet inspection practices. It is my understanding that Fairless billets were expected to be beautiful, perfect, flawless, and maybe even wet-sanded by hand. They would have a beautiful surface, no pipe, and be a superior billet -- this has proved to be a very great misconception.

Fairless billets have defects, occasionally an unusual and abnormally high number. Billets obtained from Geneva or Duluth also have their share of defects. This outside steel does have very little and practically no pipe, but often has a poor surface. The exact opposite was the case with Pittsburgh steel, where pipe was common but surface quality generally good.

The mill has been processing Fairless steel since February, 1964, but conditioning records were not kept until June, 1964. This is very unfortunate -- billet quality cannot be statistically evaluated without some source of reliable report. The conditioning reports from June to the present have been compiled and analyzed. The description of defects was found inadequate and the form is being revised to indicate defect severity. A dependable, accurate billet quality study can only be made after the new form is in use. The study to date is inherently inaccurate as it does not indicate defect severity.

In addition to the problems of the conditioning report, all conditioning of Fairless billets until July 6, 1964 was made at the discretion of the Morgan Mill foreman, using his judgement based on experience with Fairless billet quality and old Pittsburgh standard practices. A memo to Mr. Newman from Mr. Wilde (May 20, 1964), recommending conditioning practices for Fairless steel, was apparently only partially instituted. The memo asked that the recommendations be entered in the Standard Practices -- this was never done.

On July 6, 1964 a meeting of M & I and Morgan Mill personnel was held to discuss conditioning practices. Pipe conditioning in general and surface conditioning of CHQ applications were discussed and several verbal agreements reached. Surface conditioning in general was not discussed.

A second meeting late in August finally shed some light on the existent conditioning operation. Two or three lifts from each lot brought into the bins for rolling are inspected and conditioned; the conditioning information is forwarded to M & I for their analysis and later institution into a standard practice. M & I was under the misconception that the lifts inspected were being used as information for the Rod Mill's further inspection or non-inspection of the remainder of the lot. This gap in communication was discussed at the Rod and Wire Mill Quality Meeting of August 27, but is not in the minutes. Mr. Callahan made it quite clear at that time that the only reason any lifts at all were being inspected, with the exception of CHQ and similar products, was for M & I's information. Many people were somewhat shocked at the meeting to learn that one lift of a particular lot could be on the conditioning tables while the remaining non-inspected portion could be in the furnace. In cases of unusually severe defects M & I would be called in to look at the steel -- Fairless heats O2W635 and O1N601 are two recent examples. But the great majority of billets rolled in the last few months have been rolled uninspected. This is of course a dangerous position to be in. The fact that it existed at all--simply due to lack of communication--is perhaps even more dangerous. Frank, open discussion meetings clear up many

communication gaps. If the two meetings between the M & I and Rod Mill people had not been held, everyone involved would still be under the same misconceptions -- and then later they would all wonder why the quality had gone to hell. The recent August 27th Quality Meeting was very good. Everyone did not come prepared with pat answers and pre-arranged and pre-discussed discussions. There was an open, frank, informative discussion, and everyone left much better informed and aware. This is good -- it is healthy. Meetings where only pre-arranged discussions are aired, where nothing new or particularly informative is mentioned, and where everyone is drowsy are a waste of time. I honestly feel that Mr. Switzer's and Mr. Stout's "baiting" questions at previous quality meetings are very healthy and lead to good meetings of the August 27 type.

Everyone is now aware of the conditioning situation and steps should be taken to change it. When Mr. Esparza arrived last month to assume his job as Technical Service Metallurgist, he inherited several unfinished tasks -- the conditioning mess being the predominant one. He has studied the situation and operation and came up with many excellent ideas and recommendations which are being formulated into a complete conditioning program.

Morgan Mill product cover a large quality range; end uses vary from highly critical applications, such as Cold Heading and Scrapless Nut Quality, to relatively non-critical items such as re-enforcing bar. As the quality of a finished rod is highly dependent on the quality of the billet it is rolled from, it is only reasonable to expect various quality levels for our billets -- and various conditioning practices. Billets for CHQ and SQ end uses are now 100 per cent inspected, but practically all other end uses are only randomly spot-checked -- for M & I information.

Mr. Esparza is setting up quality classes for billets. He assigns highly critical items such as CHQ and SQ to Class 1, which would be 100 per cent inspected and conditioned as required. Class 4 could include non-critical items and would not be inspected at all. The setting up of these classes is the first and most important step in the revision of our conditioning practices. The second and nearly as important step is primarily the acceptance of an idea -- that the over-all surface quality of a heat can be evaluated by a thorough analyses of random lifts.

A typical Fairless heat for the Rod Mill contains about 18 Bottom and Middle lifts of about 50 billets each and about 5 Top lifts. The inspection and conditioning of one lift of Tops and four lifts of Bottoms (two Bottoms and two Middles for heats of three-way separation) will give a good indication of the over-all quality of the heat. On the basis of this random inspection and the analysis of macro-etched billet samples, the heat can either be "held" or "released" by M & I. A held heat would require further and perhaps 100 per cent inspection before rolling. A released heat could be scheduled for rolling with no additional billet inspection. This type of inspection would be used for end uses in the Class 2 and 3 category.

As the ship is unloaded the five lifts of each heat could be placed in a special section of the permanent storage area. These lifts will be inspected and conditioned as soon as possible and returned to permanent storage with the remainder of the heat. Production Planning will be notified of all released heats as soon as the information is available -- these can be scheduled for rolling. Heats which require conditioning would be conditioned before even being considered for scheduling.

This system would partially detach the Rod Mill from its dependence on the conditioners. The conditioning, if any, would be done in advance of scheduling. It would provide a backlog of known good material for Production Planning and eliminate the occasional hasty scramble for a substitute heat when a bad one is found on the tables. It might even be advantageous to move the conditioning tables and shack to the permanent storage area so there would be less movement of the sample lifts. Perhaps the present conditioning area could be converted to additional storage bins, providing a surplus of known good steel for the Rod Mill and Production Planning. There are many problems involved in this idea -- as with anything new -- but it merits some serious study.

The conditioning plan in general -- the establishment of quality classes, partial inspection, and M & I releasement -- is an excellent solution to our conditioning mess. It is basically the work of Mr. Esparza and I feel he should be given credit and recognition for it. He has discussed the conditioning situation with all involved and has arrived at a solution which will be hard to beat. It is definitely needed here at Pittsburg and any hesitation in its institution will only lead to a longer period of poor existing practices -- and inherently poor quality. The plan will lead to changes in scheduling and therefore changes in the practices of Production Planning. There will be gripes and complaints. I think it would be a grave error to kill or table the conditioning proposal simply to avoid major changes in the current practice or to avoid the displeasure of overly conservative or security-conscious individuals. The fact is that the current practice is not only inadequate but, frankly, ridiculous -- and nearly everyone aware of the situation agrees in principle with that statement. Mr. Esparza's plan should be studied, perhaps modified if anything has been overlooked, and instituted -- as soon as possible. If the present situation existed in a Japanese plant, I am confident it would not take an Act of Congress to change it -- it shouldn't here at Pittsburg either.

The top-most billet of each Fairless ingot is stamped with a "T" on its bottom end. Fairless could place all of these top-most billets in one bundle (with a little diplomatic persuasion) and this lift could be pipe-conditioned. The results obtained in the piping of this particularly pipe susceptible lift could be used to dictate the further pipe-conditioning of the rest of the heat. If a procedure like this could be successfully instituted -- and there is no reason why it could not -- it would lead to a great reduction in time spent on pipe-conditioning of Fairless steel. I think this is an idea meriting further investigation.

The only means of communication between the conditioners and the outside world is generally by walking to the Morgan Mill office-- this is time-consuming and tiring. An intercom line should be installed between the conditioning shack and the foreman's office. This is a very simple recommendation which could save a great deal of time.

There has been much discussion about non- vs. single- vs. double-deseaming billets from Fairless. Some people feel that the deseaming will eliminate many of the surface defects on Fairless billets -- I don't think it will. This is a good time to remind you of the inherent limitations mentioned in the Introduction -- three months experience isn't much, and my deseaming thoughts should be taken with a few grains of salt.



Mr. Bengston feels that many of the seams and cracks on Fairless billets -- heat O2W635 in particular -- are the result of billet mill problems. Mr. Kitchen feels that many of the finer seams are due to rapid cooling of the billets after rolling. A single-deseamed Fairless billet is deseamed as a large bloom; a double-deseamed is given a second scarfing as a smaller 9 x 9 inch bloom. The deseaming operations would therefore not correct either of the two conditions mentioned above. I think we can expect the single and double-deseamed billets to be somewhat better than the non-deseamed type, but the difference will be quite small and probably insignificant.

I attempted to launch a definite billet sampling system to replace the haphazard method now in use. Mr. Johnson of Production Planning sunk the proposal -- all the other people involved approved it. Mr. Johnson claimed that the Production Planning personnel were too busy and he could not increase their work load. The initial memo I wrote is attached to the end of this report. I recommend that my proposal or preferably a version of it modified to work with the new billet inspection plan be enacted soon. Billet samples are very valuable and, with the current "system", are often difficult to come by.

The conditioning tables are too small to completely spread out a 50 billet Fairless lift. They were apparently designed to accommodate smaller lifts. This means that when a 50 billet lift is "inspected", only 30-40 billets are inspected -- the remainder are not. The effects of this condition become dramatically obvious if we examine some statistics: in the three-month June-August, 1964 period, 4222 CHQ billets were processed. Of these 2869 were inspected, 1277 of those inspected required conditioning. Thus a quality which is to be 100 per cent inspected has only been 68 per cent inspected; of those inspected some 45 per cent were defective. This says to me that we are taking a bad risk rolling the uninspected 32 per cent. It is a condition which merits some sober thought. The solution could be either larger tables, which would be easy if the conditioning area is moved, or smaller lifts.

By far the most important thing I want to say about billet inspection and conditioning is that there is no adequate practice. A program has been devised by Mr. Esparza and he is formulating the proposal. I reiterate -- it should be instituted right away.

#### IV. Rolling Operations

The actual rolling operation begins with the stocker and ends with the controller of the reeling pits. I have observed nearly all aspects of the rolling operation this past summer, but the time spent has not been sufficient for me to develop a feeling of good vs. bad rolling technique. That type of feeling comes with experience, which is something I definitely lack -- three months is not experience, it is a survey.

I do have some observations and recommendations, but they are not nearly as important or necessary as those dealing with billet and rod inspection.

The stocker has billet length standards available on the charging platform but apparently makes no use of them -- if he did the wall of the furnace would not be periodically razed out by over-long billets. If someone would diplomatically (we don't want a walkout) inform him of this fact, we might save a furnace wall or two.

I have observed the rolls being machined, watched pass and roll changes, and examined the surface of the rolls in the stands. Pass and roll change frequency were increased earlier this summer and rod surface has been satisfactory. There are still some scale problems but they are primarily restricted to the front of the coil -- the first few convolutions as the rod enters the reels. The first few convolutions are reeled quite hot but are cooled when the operator turns on the water. A particularly lethargic operator (the more common type) will allow 12 or 14 convolutions to enter hot before he gets the water on. I have observed one man who seldom allows more than four convolutions to enter hot, and often less. If the operators could be reminded of the difference in scale and microstructure between rods reeled at 1800 and 1400°F, it might shorten their poor reaction time.

The Rod Mill Rolling Schedule, prepared by Production Planning, is very often modified before rolling. New entries are made and other entries discarded. The revised Rolling Schedule should be printed and distributed as a permanent reference. The only accurate rolling record now distributed is the Rod Dock Inspectors' Report which is not as informative as the Rolling Schedule.

## V. Rod Inspection and Testing

The inspection and testing of rods is a very important function of the Morgan Mill. The Rod Dock examination determines the quality of the product and thus deals directly with the customer. The information obtained by the inspectors also informs the Rod Mill operating personnel of laps and other defects in the rod. The inspection and testing practices now in use are fairly well known to all involved. They are outlined in the Morgan Mill standard practices and have been in use for some time. Unfortunately, they do not do an adequate job.

The Rod Dock inspectors are dependent on two tests -- the torsion and the upset. The upset is generally used for products which will experience an upset-type deformation in their final use. The torsion test is used primarily for small rod destined for Wire Mill products. The torsion test is no longer in use by most steel mills -- it has been replaced by the upset in nearly all cases. The problem is that the torsion test is not doing the job. The job is to detect rod defects; the torsion test is not doing this. I have a folder of photographs of bad laps and seams which failed to show up on a normal torsion test and most of which were shipped as prime products. Here again we have a dangerous situation -- it was discussed at the August 27 Quality Meeting. In a mill where most of the billets are not even inspected, let alone conditioned, we have a rod testing facility which is unsatisfactory. It's like telling the Japanese to "---come and get it!"

The upset test appears to be doing a good job of detecting seams and laps, but our information is scanty. We need a good comparison of torsion vs. upset test results for all steel types -- this has been proposed, discussed, and will be started as soon as the manpower is available in M&I. The memo proposing the testing program is attached at the rear of this report. The testing project should culminate in a specific testing recommendation for all end uses and all steel grades. All steel grades and product types should be sampled and analyzed, including large rod, even though torsion tests on large rod cannot be performed. I recommend that other testing methods also be considered and a thorough search of the literature performed to discover what is being done elsewhere and why.

The current Rod Quality Program was started in early May of this year. A Quality Committee was announced at the May 7 Quality Meeting and the first report covered the two week period ending May 16. The program has been in operation for four months but has been changed somewhat in the past month. Originally the idea was a random sampling of critical end uses of both high and low carbon rods. Due primarily to our defect problems with Fairless billets, the Rod Quality Program was modified to sample the first rolling of a heat whenever possible. This procedure was announced at the August 27 Quality Meeting. The results of the sampling of the first rollings have been used as an indication of the quality of the heats. Thus the present Rod Quality sampling procedure is far from random. Until we have definite billet conditioning practices and adequate Rod Dock tests, we must continue the practice of sampling first rollings.

An accurate representation of outgoing rod quality can only be obtained through a random sampling program. If this is desired, it should be formulated so that the sampling process is fairly routine and not subject to selection on the basis of heat number or billet source. A list of critical end uses could be written and the inspectors instructed to sample every fourth rolling of the critical end uses (four is simply a figure for illustration -- every fifth, sixth, or thirteenth rolling might be a better figure; this should be investigated also). Perhaps Production Planning could be diplomatically induced to write "samples" in the Remarks section of the Rolling Schedule on each fourth or so rolling. A program such as this would be truly random and give a good general rod quality picture. If it is not desired at present, it should be used in the future when our conditioning

mess is cleaned up and the Rod Dock has some good tests (I'm a naive optimist)-- for then the present "first-rolling-sampling" method will no longer be needed.

A big problem with the Rod Quality Program is that it has been sampling #4½ (7/32") rod almost exclusively. The program was set up to sample four coils, front and back, for a total of eight samples per selection. Eight 4½ samples fit snugly on a standard one inch micro -- eight 1/4 inch or larger samples do not. This has been the primary reason for sampling only 4½ rod. We have been working on the assumption that larger rod sizes should not have as many defects as the smaller because they go through less passes. We have no way of knowing whether this is true or not -- the new testing program should tell us. When a random quality study is finally started, it should investigate all rod sizes or size groupings; size groupings should be established around the more popular rod sizes. Our present Rod Quality Rating Guide was set up for 4½ rod only -- similar guides should be devised for other rod sizes.

Front samples from high carbon coils often break during torsion testing. This is a common occurrence and is due to the front being more brittle than the back of the coil. The front is composed of those 2 to 14 or so convolutions which enter the reels much hotter than the others and form the base of the coil. The coil is then carried out on the conveyor to the water spray area where those same hotter fronts sit in a puddle of water. The resultant quenching effect leads to a more brittle structure for the front convolutions. This should cause no problems on rods to be patented before using, but on green-drawn and outside customer material the brittle structure could be dangerous. It may be worthwhile to trim off more front convolutions -- as many as are needed to "pass" a torsion test. The water spray not only leads to a brittle coil base (front) but to a non-uniform structure, because the area exposed to the spray naturally cools much faster than the non-exposed regions. I have seen this on rod micros, where one side of the rod is coarse-grained and the other side of the same rod is fine-grained. The ideal solution would be to eliminate the water spray on the conveyor, but if this were done the squawk would be heard on the dark side of the moon.

The testing and sampling programs I have proposed will cost money. More samples mean more items to investigate and more micros to be made -- this is expensive, too. But when we stop to realize the tremendous investment the Corporation has made in the ships, the dock, the cranes, and the permanent storage facilities, it becomes evident that USS does not intend to give the remaining 50 per cent of the western wire and rod business to the Japanese. If this mill is going to continue producing rod, it has to produce not only good but better rod. It isn't reasonable to expect the Japanese to become less aggressive in the future-- their steel capacity is increasing, and they have to sell it somewhere. We cannot produce good rod without adequate tests, and there is no way to determine rod quality unless we sample. Therefore, I recommend the Rod Quality Testing Program be vigorously started and quickly completed. After it is completed and the new or modified tests in use, a random sampling program should be initiated so this mill can be kept informed of its rod quality level.

The inspectors at the Rod Dock should be subtly educated in the realities of a quality-conscious market. They should be told that just because it was good enough 15 years ago doesn't mean it's good enough now. I really mean this and recommend that it be done -- subtly and diplomatically.

## VI. Wire Mill

The Wire Mill routinely fills out a "Request for Metallurgical Examination" whenever they have problems of a metallurgical nature. This form has been used to follow up on our Rod Quality Program. Any sample which is micro-analyzed as a rod defect is thoroughly studied -- its rolling and conditioning history is looked up and analyzed. This is a very useful supplement to the Rod Quality Program, and I recommend that it be continued. Whenever the micro-exam shows pipe or other serious defects, the Wire Mill should be so notified and arrangements made to sample the unprocessed rod and the unrolled billets, if any, for examination.

I feel that the Wire Mill should be treated as a Rod Mill customer and receive credit for scrap, diversions, dispositions, etc., which are due to rod defects. Such a system might break the Rod Mill with our present billet and rod inspection practices, but, on the naive assumption that this report will be acted upon and the billet and rod inspection mess (literally) straightened out, the idea is reasonable, fair, and could be instituted in the future.

Before the Wire Mill can be treated as a customer it must act like one. This means the Wire Mill should have its own inspector and should not draw everything indiscriminately as it does now. There is no reason why an experienced man cannot inspect the rods before drawing -- surface defects could be spotted and the guilty coils scrapped or diverted. Such a practice could not help but improve wire quality. The Wire Mill inspector could receive a copy of the Rod Dock Inspectors' Report and be responsible for the proper filling out of the Metallurgical exam cards.

A quality-conscious crew is worth a dozen tests. The Wire Mill crews should be made aware, if they are not already, of the quality-conscious Japanese and our decreasing share of the western wire market.

## VII. Metallurgy & Inspection

M&I has been concerned either directly or indirectly, in nearly every paragraph of this report. Every mention of quality, testing, and sampling is directly related to M&I.

M&I is responsible for the new billet inspection and conditioning proposal. I urge that M&I finish formulating it, advocate it, urge it, and after its adoption, enthusiastically guide and use it.

M&I is responsible for the new Rod Quality Testing Program. The program has been formulated and approved by all involved; some samples are already available to begin testing -- the problem is now to find the manpower. I urge that M&I not rest until the program is completed and its recommendations adopted.

I recommend that the Billet Conditioning Survey, a statistical consolidation of the Conditioning Reports, be continued and used.

I recommend that M&I continue to thoroughly follow up the metallurgical exam cards it receives from the Wire Mill and make these results known.

I recommend that the Rod Quality Program, as presently used, be continued and the resulting information be used to aid in the policing of bad heats and rollings.

I recommend that billet sampling be continued and a definite sampling procedure instituted. The manpower problem is again evident as billet samples take some time to prepare.

And finally I recommend that M&I take the initiative, as it did on August 27, of making the regular Quality Meeting an interesting, informative, frank, and worthwhile event.

### VIII. Final Comments

I sincerely mean everything I've written in the last 11 pages. I feel that the conditioning proposal and the rod testing experiments are both urgently needed and should not be delayed. I also feel strongly that this mill should do everything in its power to educate, develop, train, and prod its employees to become quality-conscious and to make them aware of the basic problems in a highly competitive industry. This suggestion does not apply to only the engineers, foremen, and management people, but to the inspectors, testers, shippers, and anyone in any way concerned or connected with product quality. It may be worthwhile to have the I.E. boys re-evaluate the incentive plans -- I get the impression that the incentive plans raise production at the expense of product quality, thus defeating what should be their purpose: increased production of a better product. The basic quality problem is employee apathy -- it is not isolated to Pittsburg Works, U. S. Steel, or the steel industry, but it is a tragedy now confronting most of American Society -- it is time it is dealt with. It is time to stop before I start talking politics.

That student employed last June is now a little less naive, three months older, not nearly as broke, and more eager than ever to pursue a degree in Metallurgy. I have enjoyed the general and specific assignments, the bosses, and all the people I have associated with -- they have all been wonderful.

Thank you to "red-light" Janie, Lupe, Bud, Alex, and all the others who have contributed to making the past 14 weeks so memorable.

**IX ATTACHEMENTS**



Metallurgy & Inspection Dept.  
September 15, 1964

MEMORANDUM

SUBJECT: BILLET SAMPLING

It has recently become increasingly necessary to obtain billet samples for M&I examination. Obtaining these samples has been a haphazard, frustrating, and time-consuming experience for all people involved. In order to have a planned sampling program, M&I has set up the following sampling procedure:

1. M&I will notify Rod Mill Production Planning of each heat to be sampled and the number of samples to be taken. This information will be entered in the "Remarks" section of the "Billet Conditioning Schedule" when it is prepared by Production Planning.
2. The conditioners will cut the samples and identify them by heat number and billet cut.
3. An M&I representative will periodically pickup the samples from the conditioning area.

Each sample will be a 4 to 6 inch end portion of the billet; only one sample shall be cut from each lift unless otherwise noted.

By: J. D. Andrade  
J. D. Andrade

MEMORANDUM

SUBJECT: ROD QUALITY TESTING PROGRAM

INTRODUCTION:

Many metallographic rod samples (micros) show various defects when examined. Often these defects are not detected by the torsion and upset tests currently in use. These defects often cause considerable difficulty in wire drawing operations.

This problem was discussed at the Rolling Mill and Wire Mill Quality Meeting of August 27, 1964 where it was announced that a testing program would be initiated to improve the tests and procedures. The following program is proposed:

PROCEDURE:

All critical rod grades are trimmed. The amount of trimming is determined by torsion or upset tests, depending on the end use. The trimming scrap of various steel grades will be sampled. M & I will determine which heats will be used. The Rod Dock personnel will be notified of the particular heat and grade. The sampling procedure is as follows:

1. Four samples about 26" each (torsion size) and one 10" sample (upset size) will be cut from the front and back of each coil (10 total pieces).
2. Each four torsion samples will be labeled front or back and the heat number will be indicated.
3. The upset sample will be placed in an envelope and labeled with heat number and sampling date.
4. M & I will pick up these samples.
5. M & I will perform torsion tests on two of each four front and back torsion samples. Test 1 will be 7 twists front, 7 back. This is the standard. Test 2 will be 7 twists front and twisted back until breakage occurs - the number of twists to breakage will be recorded. If a particularly brittle sample breaks before the 7 front twists have been completed, the actual number of front twists will be recorded.
6. After all grades have been sampled and the torsion tests performed, M & I will arrange for upsets. All samples will be upset 15, 30, 45, 60 and 70 percent. The lower 15 percent upsets will all be performed first, then the 30, and so forth. When the samples fracture at a particular upset, the testing will stop at this point for a particular sample.

7. The remaining two "torsion-size" samples will be saved in case additional testing is needed.
8. Micro-examination of the samples will be made and the analysis compared using the various test results. M & I will then recommend specific tests and testing procedures.

CONCLUSIONS:

This program, when completed, will lead to a much needed revision in the rod quality tests and practices of the Morgan Rod Mill. The procedure described will permit sampling at a minimum of expense since only scrapped material will be used for samples. The success of this program will be dependent on the cooperation of all parties concerned.

By: A. G. Esparza

JDA:jb

cc: D. C. Wilde  
J. P. Newman  
E. L. Slagle  
H. F. Stout  
B. Callahan  
A. Warren  
T. Lichti  
F. Castellotti  
W. P. Thompson  
A. G. Esparza  
W. Knight

— ~ 1964 Metallurgy - Flotation - STSC P. 1

He walked down the steps of the bleak, brick  
bldg and into the cold, ~~at~~ night. The moon was  
invisible but its light was enough to see the various  
cloud patterns and formations. The air was crisp <sup>and</sup> clean.  
He zipped-up his jacket, arched his head back, and  
let the fresh rain saturate his face. He was not  
walking rapidly, but slowly — he enjoyed the rain and  
the night. Now and then he would turn around and walk  
back ~~wards~~ <sup>wards</sup>, surveying the mill ~~of~~ its various structures and  
layout. He scanned the wire mill in his right and the  
cold-reduction building on the left. He could see the docks  
far into the distance — the two huge cranes unloading steel  
billets from a sea-going freighter. He could hear the  
sharp blasts from the rod mill whistle, saying that  
another ~~piece~~ <sup>30 foot length</sup> of steel was beginning its journey thru ~~the~~ <sup>the</sup>  
~~many~~ <sup>many</sup> pairs of rolls which would deform, stretch, and squeeze it  
until it became a coil <sup>prod over</sup> ~~of~~ <sup>a</sup> mile long.

This was something about metallurgy that fascinated  
him. Perhaps it was the thought that he was an "iron & steel"  
man — ~~even~~ <sup>an</sup> in the industry which is a cornerstone of national  
life. <sup>He enjoyed</sup>

p. 2

one instant and ten minutes later running his hands over the rough, sealy surface of a steel billet - seeing his hands become black with the flaky oxide. The sound of the huge impact tester, whose eccentric flywheel sounded like one of those monster ants in the movie "Them", - it all fascinated him. He enjoyed metallurgy because it required enough technical knowledge to make him feel intelligent; and because it required enough physical labor and hand dirtying to make him feel he was not in welfare.

He walked across one of the hundreds of tiny track spurs in the large mill - and walked on into the tunnel. The red grease rags were strewn all over, an apple core, an empty lunch bag, and a piece of wax-paper - it was fairly clean - much cleaner than the parking lot or roadway outside. The tunnel was a ~~square~~ rectangular concrete passageway passing underneath a multitude of tracks - it allowed the men to enter the plant without interference with or being interfered by the railroad traffic. He liked the tunnel. The echoes in its hard, square walls were different & exciting. He enjoyed walking thru the tunnel at night - singing,

p-3

- laughter, whether it — disturbs no one's static bounds  
of sanity and, happiness, and security; but only because  
no one was there. He would see himself in the mirror  
at the end of the tunnel, with its little sign: "Your  
family's most precious gift — YOU", but he had no  
family

He drove alone, on a dark night and on an unknown road. But then all roads are unknown. Even the so-called known ones have their detours and washouts. What is so fascinating about an unknown road -- you never know what is beyond the rise, you do not know when or where the next tight turn will come, when the next rock, rabbit, or empty beer can will turn up to challenge your reflexes and judgement. An unknown road is a challenge. Every turn, every tree, every rock, every color is new and unexperienced-- and something you may never see or experience again.

He drives the unknown roads. He drives them, runs along side them, and often walks on them. Some men follow the unknown roads ...searching, asking, questioning, wanting-- wanting someone to follow the unknown roads with them --to combat the ever-present loneliness. The man of the unknown road is a lonely man, a man who wants to stop, a man searching only for the end of that loneliness....but the man is so obsessed with the unknown, with the hypothetical search that he can never stop. He knows this; it hurts, but he knows it. A life of loneliness, borne only by the challenge and adventure of the unknown.

But what does he really want? Does he want the companionship and security that comes with not being alone? Does he really want to be quote happy unquote on common familiar known roads. Only those who have never felt the call of the unknown can answer yes, and many of these wish they had felt the call. Can the two be resolved? Can the ever-present loneliness be combatted without losing the challenge and unknownness common to that loneliness? It can with the meeting of two unusual people. People who love to climb mountains to see what is on the other side; people who would prefer to wander along the tracks and unknown fields than to windowshop downtown; people who want to read, talk, love, learn, and live -- in their own possibly peculiar but individual way. Two people who would just as soon tell society to go to hell as to go anywhere else; people who chose what they do and assume full responsibility for it, whether it is driving chainless in a snowstorm at fifty miles an hour, jumping out of airplanes, or hopping rides on freights to nowhere. Two people who enjoy people, mountains, rivers, trees, books, kids, lakes, animals, work, the sun, the stars, the sky.

He is one of these two .. he searches for the other or others. Surely they exist, the simple problem is to find them, sometime while life and body are still young, eager, loving, and living.

Until the search is ended the unknown roads, the unknown mountains, airplanes, lakes, rooms, books, and sky will be lonely. That is the way it is.

probably ~ 1964-1965

You ask for a "Career Statement." That I cannot honestly give you.

I am a trained man -- I am not an educated man, not yet. I am an engineer who knows what Existentialism is, who knows the differences between Socialism and Communism, who understands what C.P.Snow means by "The Two Cultures," who is intensely interested in the sociological implications of automation and cybernetics -- I am an engineer who is substantially aware of his world and its problems. But I am not yet educated. I have never studied sociology to any reasonable depth; I know relatively little about political science, eastern religion and philosophy, or the history of Asiatic peoples; I have ~~no/feeling~~ no knowledge of African history or Africa's social and political problems; and though I have a much better <sup>knowledge</sup> ~~understanding~~ of Latin America's problems and ~~the~~ people, it is a cursory, surface, and inadequate knowledge.

I cannot give you a step-by-step plan for my "career." I am not sure I even approve of the word. I could write a "Career Statement" describing and making a case for myself as a budding doctor, lawyer, senator, engineer, businessman, or Presidential scientific advisor. ~~And/what/would/they/say~~ Of what use would such a statement be? For me, and for someone else trying to understand me, relatively useless. I am a very honest and open man, and that honesty and openness grows with my knowledge, understanding, and awareness of myself and the world and people around me.



To/day/I/might/say//I/want/to/be/a/United/States/senator//  
And/tomorrow/or/next/week/or/next/year?//

I do not want to "be" anything but myself. I may want to perform certain functions, assume various obligations and responsibilities, and accomplish definite objectives. I may study engineering, philosophy, public affairs, political science, or sociology and use these fields as tools for the accomplishment of my hypothetical goals. A field of knowledge is not an end in itself -- this is the core of my dissatisfaction with conventional engineering teaching and practice. A field of knowledge is merely a tool; one tool alone often does an inadequate job. There is no point using a ten pound hammer where a one pound one will do the job.

The above paragraphs may lead some to label me ~~irresponsible~~ immature/~~unpredictable~~ and irresponsible; it wouldn't be the first time. I have not and do not intend to fabricate a "career", concisely describe it and my reasons for choosing it, and then hand it to the Graduate Admissions Office with a pretty bow tied around it. I am being frank and open with you, completely. If the purpose of the Engineering and Public Affairs program is to train engineers in public affairs, then I want no part of it, just as you would want no part of me. But if the purpose of the program is to provide ~~people~~ some people with the tools to understand and deal with political and sociological problems in a highly technical society and world; if it is to tell some people that assuming the tools, the brains, and the creativity, there may be simple solutions to complex problems; if it is to inform some people that there exist other cultures, philosophies, and ways of life

than our own and that they must be very seriously considered  
when dealing with political and social problems; then ~~it~~ <sup>the program</sup> is  
precisely what I am looking for.

Third letters - Scientific - humanist  
collaboration Understand people, then help  
them to be responsible enough so they can help  
themselves

Overseas - understand people -  
more in Latin America - South Africa  
politics - or advisory

doctors - teach

SJSC early 1965

A MAN

~~THE MAN~~

He ran and ran and ran. He was not a runner, but yet he ran... tired, exhausted, elated at running on. The cool night air felt brisk and arrogant, nearly as arrogant as he. He looked to the heavens -- dreaming, thinking, wondering, longing. He was a man. Not really very different from other men, and yet totally unlike any other man ever born. He knew this, loved the fact, treasured it. He did not know why he ran, he had no reasons. He wanted to run... he enjoyed running... he chose to run.

He kicked at the leaves on the walk and ran through a large pile of them, then stopped, allowing them to fall on his head, his arms, brush his face. Why? He knew not and cared even less. He ran. A strong pain pierced his side, his lungs burned, his face sweat -- and yet he ran, on and on, until he could run no more. But he could run more, he knew that. He could run to death, and he knew he had the will to do it. But he stopped, he chose to stop, he wanted to stop... for as much reason as he wanted to run: none. Simply because he wanted and chose to.

He was not running from anything but towards everything. He was running into life, into experience, towards people. He loved his life, knew it was all too short, knew that there was so much to see and to do and to learn and know. No, he was running from nothing -- he was running towards everything. Why?

He knew not. I know not. He could have lived as many do. He could slide into some rut; he could choose to live the normal life of routine. He did not despise it, he did not consider it; but he knew he could choose it. He could worship a man-God who doled out punishments and rewards with the whims of a child -- for no apparent reason, but simply because this God chose to. Why let a God choose for him when he knew he could choose for himself?

He ran... clutching the low-hanging leaves and branches, swinging on the limbs, singing, whistling, enjoying, living. He had no problems -- concerns, yes... but problems, no. He realized that he was not aware of all -- that he may someday have problems he could not now conceive of. He would cross that bridge at the proper time; and if the bridge did not exist, he was confident he could build one.

He was a rare kind of man. He was everyman. He could play the normal games of life and yet be aware he was playing them. He could be a husband, a father, a student, a teacher, engineer, politician. He could be any or all. He simply had to choose.

He enjoyed people. He savored the wine at the bar, the bum on the street, the laborer in the orchard. He enjoyed the man with his thumb up on the side of the road -- but only those who made an effort to go on, not those who would raise their thumbs but refuse to take a step. He enjoyed those with white shirts who could talk, who were not falsely secure, who were not a front, an image, a non-real smile.

He ran towards the swings. He loved the swings, the wind, the movement, the height... and the children. He loved the trees, the flowers, the water. He enjoyed books and papers, dirt and tools, strong minds, strong bodies, strong hands. He could not understand those who let their minds, their bodies, their hands...waste. He relished his mind and his body -- he enjoyed his life with them.

He took his chances and treasured his experiences. He was not afraid of death. He knew it was inevitable, unavoidable, and very real. Why fear it? And the lack of fear released him. It released him from the bounds of fear. It liberated him from the search for security. It freed him from the quest for prestige, for status. It allowed him to live. It released him to do what he pleased -- so long as he interfered with no one else.

He could talk frankly, openly, honestly. He was able to write what he felt, confident enough to not care what his readers thought and yet <sup>open</sup>~~secure~~ enough to

consider their thoughts and opinions. He had no image for the world to possibly shatter; he had no glass ego which had to be constantly sheltered and protected. He was the object, the subject, the man -- not the image. His ego was real, deep, honest -- it was not shatterable; it was ductile rather than brittle. It was not easily deformed or molded. He could talk openly with people-- openly about himself, not as openly about them. For he knew that their image and their ego might not be as unshatterable, as strong, as ductile as his. He was not destructive -- he was an individual man. It was not for him to tinker with the lives of ~~men~~ others.

He lived on. Now choosing to play one of the particular games of life... and now choosing to play no game; at one instant living life as others live it, at another instant living it as only he can live it: meeting people, experiencing, knowing, learning, loving, and living. As only he could live it. For he is a man. There is no other quite like him. Nor will there ever be.

Early 1965

# STSC Essay

THIS I BELIEVE.....

Midnight: Nov. 16-17, 1964

I am a man. I was born, I live, I will die. This much I know. I am a free man whose choices are free. My values are my own; my morals, ethics, goals, and objectives, if they exist, are my own.

I am not an island, but I am sufficient by myself. People influence me, help me, entertain me, praise me, and criticize me -- this is the way I chose it, this is the way I want it.

I am aware of many things, but there are many more I am not aware of. The things I know have come about through experience, education, people, reason, ~~and~~ logic, and -- just as importantly -- emotion. I am not a totally rational man, I am not a totally objective man -- perhaps I could be. I chose not to be. Don't ask for a reason -- I have none; only that that is the way I will it.

My primary goal in life is as yet unknown. Once I thought it was to enjoy it, but now I feel it may be to experience it -- the two may be synonymous ~~for me~~. I do not plan a "career", I do not search for a "position", I search only for myself, but not obsessively. I do not intend to live in a rut, but I will not live my life in fear of ruts. If sometime I decide that I want to experience "rut" living -- so be it; I have done it before and no doubt will do it again. I once thought I was a humanist but do not any more -- perhaps I will again sometime. I have no desire to go out of my way to help people, though I sometimes do -- in any case I do not feel I have any obligation to help them. Most people are self-sufficient only many do not realize it.

I am basically a lonely man. I am a selfish man searching for the end of his loneliness -- someday I expect to end that search and find what I seek: a woman I can respect, love, and feel a bond with. The finding of this woman will make my life infinitely more meaningful than it is now, but I am prepared to accept the possibility that she does not exist, or, if she does exist, that I may not meet her before my inevitable death.

I am a very fortunate man. For some "reason" I was born and developed myself into a man who is self-sufficient, relatively secure, independent, and very confident. My life is very meaningful now and no doubt will continue to be; it will be even more meaningful as I become ~~aware~~ more and more aware of the various facets of a living existence. If I do not find this hypothetical woman, I will continue being somewhat lonely. If I become too lonely, then I will chose to experience death -- but I do not feel that <sup>this</sup> is <sup>LIVING IS SO</sup> ~~a~~ very probably. ~~I am so~~ <sup>ing</sup> fascinated and enjoyed <sup>for to me</sup> ~~by~~ living that I want my life to continue until ~~I have no~~ there is nothing left to experience, to see, to hear, to feel -- only when I have become aware of everything there is do I want my life to cease -- no doubt it will end long before ~~that~~.

I do not fear death. I question it, I do not wish it, I ~~do not even~~ desire it, but I do not fear it. If man's death is inevitable, then there is no reason to fear it. Death is simply another experience. When life is almost over we can always look forward to one more experience, one more unknown -- death. ~~This~~ -- probably the greatest experience of them all.



I am an authentic man. I know what I am, I know what I am not. No one can say I am or am not real, true, authentic, honest, ethical, or any other non-defineable term you care to use. I am what I am, and this is what is important. What other men say I am, can be, or have been has no real bearing on what I am, ~~what I say I am, what I know I am,~~

I choose to live in a society with people, rules, codes, and obligations. Yes, I chose to live in it; the fact that I am living in it necessitates the choice. I can leave it at any time, if not by going somewhere else, then by forever removing myself from it (and every other society as well). I have, do, and will flaunt and disobey some of its rules and codes -- I do it openly and will admit it if asked, though I would never feel obligated or inclined to volunteer that or any other information, unless I so desire. I am prepared to accept such punishments and restrictions my society may impose for these violations. The fact that I live in this society, am aware of its rules, and <sup>occasionally</sup> willingly disobey them, means I must be ~~willing~~ responsible for my not only in this but actions, ~~-~~ in every society of which I am a member. ~~at all times,~~ I am a member of many societies, and I have responsibilities, privileges, rights, and obligations in every one of them -- ~~this is the way it is, therefore this is the way I choose it -- this is the way I choose it, therefore this is the way it is.~~ I am a human being, I am an American, I am a student, I am an engineer, I am a lay philosopher, I am a parachutist, I am a state and city resident -- I am all of these, each with its particularly characteristic society; each with its

own merits, obligations, and privileges. Many of these overlap, some do not -- some may even be anti-thetical. I realize this, am aware of it, and openly so choose it.

I am an honest man. I may lie, and even steal at times, but I realize this and assume full responsibility for it. I have no conscience in the sense of an infallible guide to right and wrong. I can lie or steal and still sleep sound -- I do not claim this is good or bad, for I do not understand it. But I am aware of it and thus assume responsibility for it.

I have no God in the sense of a capital G dictating morals, values, goals, promising rewards and threatening punishments. My God is what I do not understand, and I prefer to spell it god. My god is my birth, my death; ~~he~~<sup>it</sup> is everything in this universe and life that I ~~do~~ not understand, which is most of it. ~~He~~<sup>It</sup> is space, ~~it~~<sup>it</sup> is a nucleus, ~~he~~<sup>it</sup> is entropy, the infinite. ~~He~~<sup>It</sup> grows smaller with every phenomena I learn to understand, ~~he~~<sup>it</sup> grows larger with every new phenomena I become aware of and do not understand. I do not know what ~~he~~<sup>it</sup> is -- it is not important. The fact that I am confident and independent means that it is not important to know what ~~he~~<sup>it</sup> is -- I want to know and learn the many things I do not know which are immediate. Once I have learned all there is to know and experienced all there is to experience, then I will search for this god and hopefully find ~~him~~<sup>it</sup>, whatever ~~he~~<sup>it</sup> may be, in the final experience of death.

I am not what I have just written. I am Joe Andrade -- to myself I am something dynamic and constantly changing; to others I am what I have been. These five pages are not what I am; I do not even claim they are what I have been. They~~re~~ are what I felt I was at the particular instant at which they were written. Upon rereading, I find that I am not that -- and yet I am that and much more; one cannot put a life and beliefs on paper. Emotions are inherent and implicit in a life; an emotion cannot exist or be described as black on white.

This is not Joe Andrade-present; this is a small portion of Joe Andrade-past. The first paragraph~~y~~ was ~~already~~ obsolete when the second began.

-30-

Midnight, Nov. 16, 17, 1964

Joe Andrade

Book blurb

~ 64-65

Howell, DG

States The Solution

Author: Walter L. Materick,

Thomasian American scientist-engineer, very concerned with the growing deterioration in East-West relations and the escalating arms build-up, conceives a unique plan for the total destabilization of the political systems of Eastern Europe. Working through scientific circles and with the blessing of the CIA and NSA, a small group of scientists proceeds to induce the defection of all major Eastern political figures, concurrently with a USA and West German propoganda blitz against Eastern Europe.

Settings: Washington, DC and environs, Salt Lake City, Reno, Seattle, Prague, Berlin, Moscow, and Munich.

Evaluation: The book is a novel, a political commentary, and perhaps a feasible solution to current crises--perhaps the only viable solution.

1988

# The Structure Breaker

A novel  
by Albert Osterick

Chapter 1 - ~~Snow~~ The Greatest Snow on Earth

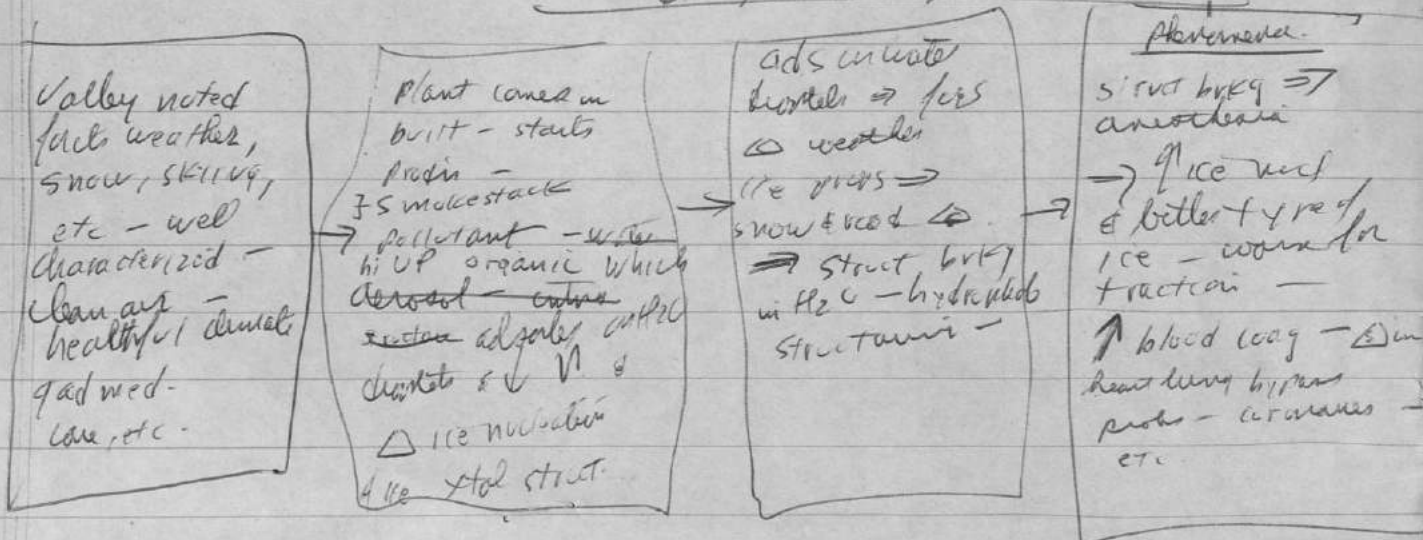
ice - snow - avalanche - front ranges & s. canyon -  
X enters waps - mts club hike } you diff this season,  
to snow/ice diff as canyon

Chapter 2 - Weather - Airport - Fog - Mist  
meteorological changes

Chap 3 -

Presentat of problem - story -

## Chronology after problem solved



# The Structure Breakers -

A Novel

by

Albert Asterick

## Chapter 1 - The Greatest Snow on Earth?

Changes in snow in canyons, cement of roads, effect of  
ski wars, salt in roads, cold hardness of plants.

## Chapter 2 - ?

Blood  $\rightarrow$  heart lung bypass - blood storage - throwing  
diagnosis - art and patients - fluid (blood related)  $\rightarrow$

## Chapter 3 - The Mystery Fogs

climate plan - fogs, rain,

## Chapter 4 -

EPA - Administ concerns - Politics - new plant

## Chapter 5 -

### Book Idea

#### The Structure Breakers

Power plant, smelter, etc  $\Rightarrow$   
new process  $\Rightarrow$   
emission  $\Rightarrow$  new type  
of volatile compound  
 $\Rightarrow$  accuml in blood -  
 $\Rightarrow$  stric conc at f-fs  
 $\Rightarrow$  structuring about  
it occurs  $\Rightarrow$   $\uparrow$  relax  
t  
 $\Rightarrow$   $\odot$  in protein water  
sheaths,  $\dots$   $\odot$  in memb  
permeb,  $\dots$   $\odot$  in  $Na^+$ ,  $K^+$   
 $\odot$  in local pores -

kid up antarct fishes a  
cold mainty cracks it -

snow  $\rightarrow$  ice  
salt doesn't work as  
before

snow diff in city  
& on forest slopes -  
snow in interior  $\rightarrow$  OK  
due to affect of low  
air ice phase

aerosol stability prob  
 $\Rightarrow$  weather  $\rightarrow$   
what EPA traces to  
CO.  $\dots$  due

Water birds near  
Z also die?

Frost har dunes  
changing

local hot spring  
→ clouds & fog  
Beck st ? ? T-15?

Cement mixing -  
Hydromet processes?  
screwed up

cold hardness ⊆  
also this occurs in  
cold area, i.e. more hardy  
plants ↓ in health  
less hardy plants ↑

Problems with plants -  
EPA  
long term chronic  
effect

get a virus involved?  
Pulse mark?

<sup>poor</sup> Blood doesn't freeze than  
properly ⇒ suspicious

⊆ desig in art kid patients  
→ mutant calostyran at 4 -  
⊆ in cancer medicine? ⊆  
and result is a controlled cancer

It has slowly almost  
insidiously a few months  
ago

Birds to scabs and  
⊆ immune to cysta  
sites ⇒ successful  
xplants

good air exchange  
due to large bird sheets

1000 carb in lake  
isolated in  
aerial spray by  
new lake mineral  
processing plant  
can attribute to & stabilize

dissemination  
wide  
around

over  
hush  
wickets

The snow was different this year. There ~~was~~ had not been a dramatic change ~~in~~, but the changes were perceptible to experienced skiers. The greatest differences were noted in virgin snow, particularly freshly deep powder. And the effects were most evident on the front range, ~~and~~ the effects appeared to diminish as we went into the canyons, until at 11,000 at Brighton, only the most experienced cross country skiers could ~~be~~ sense a difference. Over the ridge, on the East slope, at Park City - the snow was approximately normal.

It was not a weather change - snowfall was normal - temperatures were about normal - the powder looked & generally felt normal - but it was not. The ~~major~~ <sup>unusual</sup> avalanche problem was one result. A number of the best and most serious cross country skiers had been caught this season - no one had been lost yet - but an avalanche phobia was developing among the local cross country crowd. Avalanche experts had no explanation - it was a new phenomenon. The University of Colorado Research Center could not understand it. There was nothing like it in the 30 year history of the Avalanche Order. Whatever the snow properties were since, it was approximately a new cause which had not occurred before.



Jim Christman was an avid skier and  
was a popular cross-country tour leader for the  
Mountain Club. He had been born &  
raised in the Valley and grew up skiing -  
primarily conventional downhill skiing.  
Jim was also a graduate student in  
the Geophysical Science at the University  
and a staff member of the Avalanche  
Research Center.