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—Improving Transactions of the ISIJ—

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I write this note with strong reservation because my own papers and reports require much improvement. Yet, I have spent the last 20 years in the United States and have struggled with various aspects of the English language constantly. Thus, I could perhaps qualify as an advisor, or at least add a different perspective.

Generally, most articles in the TISIJ do need, to put it mildly, improvements in their presentation. Obviously, this must be the reason Professor R. Tanaka asked me to write on the subject. Earlier, Professor T. Nakamura also sought my input. I made several observations and sent him my recommendations, which were mainly concerned with the editorial and review processes. Since I owe many professional debts, I am anxious to oblige their wishes. However, because I am no expert in English, advice on grammar and style must be sought from textbooks or someone who has ability in this area. I will comment on five aspects that apply to both the English and Japanese papers from the ISIJ.

Remember, too, that many American students have trouble writing properly. If your predicament looks insurmountable, it is comforting to know that many others are in a similar plight. Your efforts will be amply rewarded, because your bright new theories and revolutionary experimental findings will gain wider acceptance and win more followers if your ideas are presented properly and effectively.

Knowing your weaknesses

Within the last three months, did you read an English language article in the TISIJ? Did you understand it? Did you agree with the conclusions of that article?

I suspect most of the readers would say no to these questions. This is natural because the TISIJ

is for overseas readers. However, this is where the improvement of "your" paper may begin. Read these papers and make an attempt to improve upon the errors noted in them. Also read the papers in the international journals of British and American origin. Try to recognize the differences in the logic, the construction of paragraphs, statements and conjectures, observations, analysis and synthesis. Unless one is able to notice the shortcomings of a paper, it is difficult to write a good paper.

To whom a paper is written?

A paper must have its objectives. The author wishes to convince the readers that what he presents is true and correct. This is a simple fact no writer should forget.

When writing in Japanese, a sentence is often ambiguous as to who is making a statement or what is really meant by that statement. Much of this problem comes from the language itself. However, if the sentence is translated into English, it becomes unintelligible or unacceptable. The intent of the author must always be clear in each sentence. In addition, every sentence should clearly indicate whether it is derived from the work of others (which must be referenced) or if it is a result of one's own observations or thoughts. Each sentence is an element of the chain of thought. If the thought is to be effectively presented, the chain cannot have any weak spots or breakage.

Paragraphs

A group of sentences form a paragraph. It should be constructed carefully so that an idea is concisely presented in a single paragraph. Logical development is essential. A reader must be able to follow from one sentence to the next and be convinced that the author makes no incorrect

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or ambiguous statements. When a paragraph presents no coherent thought, or logical sequence, an intolerant reader starts to read the rest of the paper with suspicion, and may even dismiss the conclusions of the paper.

The importance of paragraphs needs special attention. In Japanese, paragraphs appear to be treated casually. In English, however, each paragraph is carefully constructed to present a coherent thought. You are well aware of the usual divisions of a paper into sections; Introduction, Procedures, Results, Discussion, etc. Paragraphs are subdivisions of these sections and act as vehicles to convey ideas. A unified concept can be developed by logically arranging the ideas expressed in the paragraph.

Leading to conclusions

In contradistinction to a mystery novel, a paper must be written to reach the compelling conclusion at the end. In the novel, it is hoped that the reader will be led to believe something other than the intended solution. In the paper, you hope that the reader will follow your selection of thoughts (which must be comprehensive to be credible), agree with your choice of the correct idea, and reach the same conclusion as the author. The reader will be lost if he is left uncertain as to the final goals, and is unable to follow the subjective judgement of the paper. Declaration of beliefs should be avoided as it will not make a believer out of a skeptic.

Who will read the paper?

No one has time to read a technical paper that has no relation to his/her own problem. The reader is likely to work in a similar field as the author. He may be a competitor. What is written must convince the reader that the author's idea, interpretations of experimental findings, theories, conclusions, etc., are better than those in which he believes.

Credibility as a fair, competent and reliable researcher must first be established. Most of the time, the reader does not know the author. He must prove that he is knowledgeable in the subject area by extensively reviewing related studies, and show fairness by citing the opposite point of view. Delineate clearly what is already known from what is newly contributed. Avoid grandiose statements, because nobody will believe them. *One small step* forward is better than many on the beaten path, even though it may not be a *giant leap* for metallurgy.

Present the contribution clearly, together with the limitations of the paper. Assumptions in theoretical development and probable limits of experimental errors should be clarified. Do not hide weaknesses by avoiding discussion of competing ideas. If it cannot be shown that the author's concept is superior to all other possible ideas, the reader is not likely to agree with the point of view presented in the paper. Gather all the supporting evidence possible, especially from the work of competitors, and include that support in your paper.

Recommendations

Improvement will not come overnight. Continual efforts are needed to write papers of better quality.

a) Read prolifically. Anything written in English! Newspapers, "Time" or "Newsweek", "Playboy" (texts only, please), *Acta Metallurgica*, *Engineering Fracture Mechanics*, etc. etc.

b) Study a book on technical writing. I recommend a book by J. H. Tichy, *Effective Writing*, John Wiley, New York, 1967.

c) Broaden the vocabulary. Learn the exact meaning and proper usages of each word by consulting dictionaries such as *Webster's New Dictionary of Synonyms*, and *Kenkyusha's New Dictionary of English Collocations*, S. Katsunuma.