TOWARDS A NEW SPILIT OF MANAGEMENT OF THE SEG OF JAPAN

Kunio SUYAMA

1 INTRODUCTION

I am Kunio Suyama, President of OYO Corporation. It was, if I remember right, around the end of January of this year that the Vice-Chairman, Mr. Ono, mentioned that he would like me to be one of the speakers at an assembly to commemorate the founding of the SEG of Japan. At that time, he asked me to speak on "The Present State of Geophysical Exploration in Civil Engineering."

For the past 26 years, that is, from 1954, I have been managing a consulting corporation. For the first ten years, I had a hand in site investigations, but since then I have been almost completely taken up with managing. I therefore did not think that a person such as myself was qualified to speak on "The Present State of Geophysical Prospecting In Civil Engineering." I requested Mr. Ono to find someone more appropriate than myself. But he insisted, telling me, "We were counting on having the benefit of your eminent sarcasm. Won't you please reconsider?" Because I was thus urged, and because I have long held a desire to do my part for the SEG of Japan, I have cast caution to the winds, and so appear before you now.

Listening to the distinguished scholars* that have appeared today, I noted not so much as a hint of sarcasm in their speeches. All were perfect gentlemen, all speaking of the SEG of Japan in the passive voice. To be frank, I really couldn't tell if any of them had any particular aspirations for the Society or not.

As you know, I am no more than a hard-working merchant. In managing a corporation made up of people like myself, one has no choice but to speak in the active voice. If he doesn't, he won't get people to follow him, his subordinates will be at a loss, not knowing

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* "The role to be played by geophysical prospecting for geothermal resource development" by Junji Suyama (Chief, Geothermal Exploration Division, Geological Survey of Japan.)
"New geoscience and geophysical prospecting" by Seiya Ueda, Professor of Earthquake Research Institute, the University of Tokyo)
"Our Expectancy in the future Geophysical Prospecting" by Yasuaki Ishiwada (Director of Japan Petroleum Development Corp.)
"Geophysical Prospecting and how it looks to the eyes of a nonprofessional" by Toshimichi Iijima (Professor, Department of Science, the University of Tokyo)

NOTE 1: Based on a speech presented on the occasion of the Spring Assembly (May 21, 1980) of the Society of Exploration Geophysicists of Japan. The original speech has been rewritten, with some additions.

NOTE 2: Reference in the text is made to a change in name that has been adopted for the SEG of Japan. The English translation of the new name, however, is the same. The Japanese name change involves a different word for "exploration". This was decided on because the word for exploration in the original name of the Society implied exploration for natural resources. The new word is more general in meaning so that exploration for civil engineering purposes is included.

what to do, and no work would be accomplished. The objectives of the company would vanish like the morning dew. So, tradesman that I am, I am only capable of speaking in the active voice. I can only ask for your forbearance and hope that you will take Mr. Ono to task if I say something improper.

My talk today is based on material to be found in the journal of the SEG of Japan, "Geophysical Prospecting", gathered from the first issue through the present. The data I will present is, of course, objective material, but I would like to forewarn you that my comments will be greatly colored by my own opinions.

2 WHAT IS MANAGEMENT?

I have referred to the Dictionary of Buddhism (G. Nakamura, 1975, Tokyo Shoseki) to find the meaning of the word "management" from the Buddhist point of view. In this context, we find that the word involves "the setting of a goal and striving to accomplish that goal". According to the standard dictionary of the Japanese language, Kojien (I. Niimura, 1969, second edition, Iwanami Shoten), management refers to "the ongoing carrying out of a project according to a plan".

Actually, both definitions are very well suited to a corporation. However, I think the same could be said about the SEG of Japan. An enterprise cannot last if it does not make profits. Private enterprises receive no special benefits from the government. We have no one to rely on but ourselves if hard times should come. In order to maintain our ability to support ourselves, it is up to us to make profits and to increase our capital reserves.

We are living in a time in which the future is very much a matter of uncertainty. No one can say what turns the economy will take. Naohiro Amaya, a commissioner in the Ministry of International Trade and Industry, made a telling point in an article he wrote for the distinguished magazine, Bungei-Shunju, entitled, "Japan--A Nation of Merchants", subtitled, "Grumblings From Store Clerks". He says, "The people of Japan should never forget that even as they enjoy historically unprecedented prosperity, a sword of Damocles hangs ever suspended above that prosperity."

I think these words express our situation very well. An awareness of this situation is part of the instincts of merchant managers such as myself. With this consciousness, we carry on our business on the basis of our own strength and our own capital. There is no other way for us but to operate within our own resources, making profits and accumulating capital. To accomplish this, we must expand our sales year by year.

Let me explain what all this has to do with an academic society. In the same way that a company must increase its profits, an academic society must continually increase its membership. . If the membership runs into a period of stagnation, this means that management has come to a dead end. This same point is made by Dr. Kumiji Iida in the November, 1973 issue of "Geophysical Prospecting".

The "capital holdings" of an academic society is its membership. To effect its increase, the society must engage in activities that arouse the interest of members and non-members alike. This is the responsibility of those managing the affairs of the society. If the members are bored, management is a failure.

An important point in this regard involves dues. I am sure everyone would be in favor of keeping dues as low as possible. In order to keep down membership fees, it is necessary to recruit large numbers of members. To accomplish this objective, you have to give the members what they want. It could be argued that this is a kind of chicken or egg dilemma, but I would submit that the first task is to understand the desires of the members, and at the same time maintain a clear view of the state of the field as it exists in the world today.

Thus far, I have been airing my own views. Now let me turn to the present state of the SEG of Japan.

3 FINANCING OF THE SOCIETY

Figures 1 and 2 afford us a look at the activities of the SEG of Japan from the point of view of incoming and outgoing funds. The figures represent thousands of yen. Figures 3 and 4 show a breakdown of these sums. You will note in Figure 3 that grants from the Ministry of Education had already ceased by 1957.

Most of the funding of our society depends on dues from the regular and special members. Income from these two sources represent 70% of that income. Figure 4 shows that approximately 70% of expenditures go for publication of the journal, "Geophysical Prospecting". It is first of all very important for all members to have a clear understanding of the income and expenditures of the Society.

Next, Figure 5 is a comparison between the SEG of Japan and some other academic societies. All of the numbers are for 1978, with the exception of those for the Japan Society of Landslides, which are for 1977. We see that about 70% of the income of the Geological Society of Japan comes from membership fees. You will note that income derived from publi-

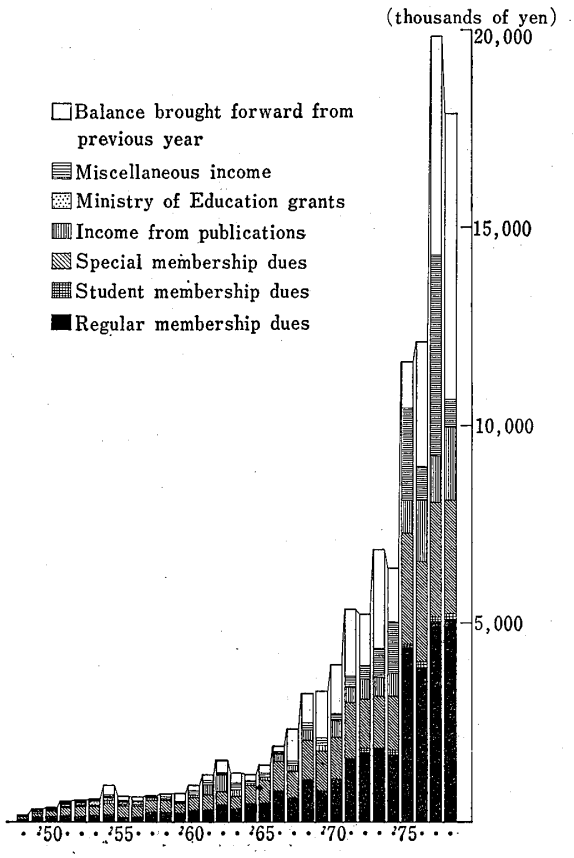

Fig. 1 Changes in financial characteristics of the SEG of Japan: Income

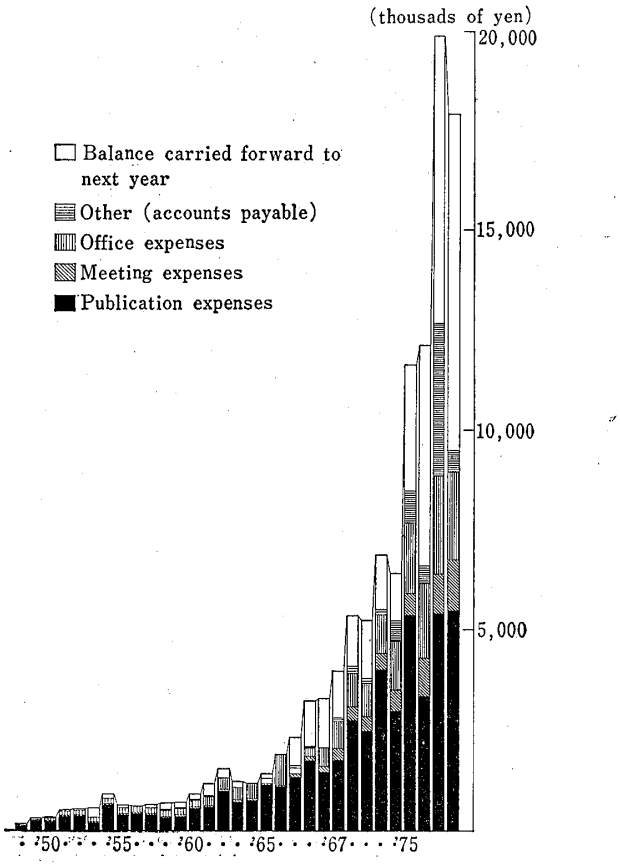

Fig. 2 Changes in financial characteristics of the SEG of Japan: Expenditures

cation is quite high for the Seismological Society, but this may be an unusual feature for that one year only. About 70% of total membership fees come from the regular members of the SEG of Japan, while about 25% come from special members. The various societies connected with civil engineering, a field which has extensive connections with business circles, are characterized by obtaining a large portion of their income from supporting members and special members. Particularly notable is the Society of Landslides, which receives 50% of its membership fees from supporting members. The Geological Society of Japan is not noted for its connections with the business world. Rather, its membership is made up largely of university, high school and junior high school teachers as well as other people from the academic world. Since income naturally depends on dues from these members, we see that management is conducted on the basis of a steady if modest annual increase in membership in this society.

We can see clearly from Figure 5 that our own SEG of Japan is different in nature from the geological society or societies in the field of civil engineering. Put simply, the geological society is scientifically oriented, the civil engineering societies are oriented towards engineering, but the SEG of Japan has no such clearly defined orientation. If I may be blunt, I would say that the management of the SEG of Japan does not have a carefully thought out philosophy.

If we may agree that the most important feature of the SEG of Japan is that its income depends on the dues paid by each individual member, which is to say that we are an organization of individuals rather than of interest groups, the inevitable conclusion is that we must run the Society in such a way as to please each of its members. Organizations such as the Society of Soil Mechanics and Foundation Engineering play a direct role in society through such activities as producing specifications for site investigations and the like. Management of

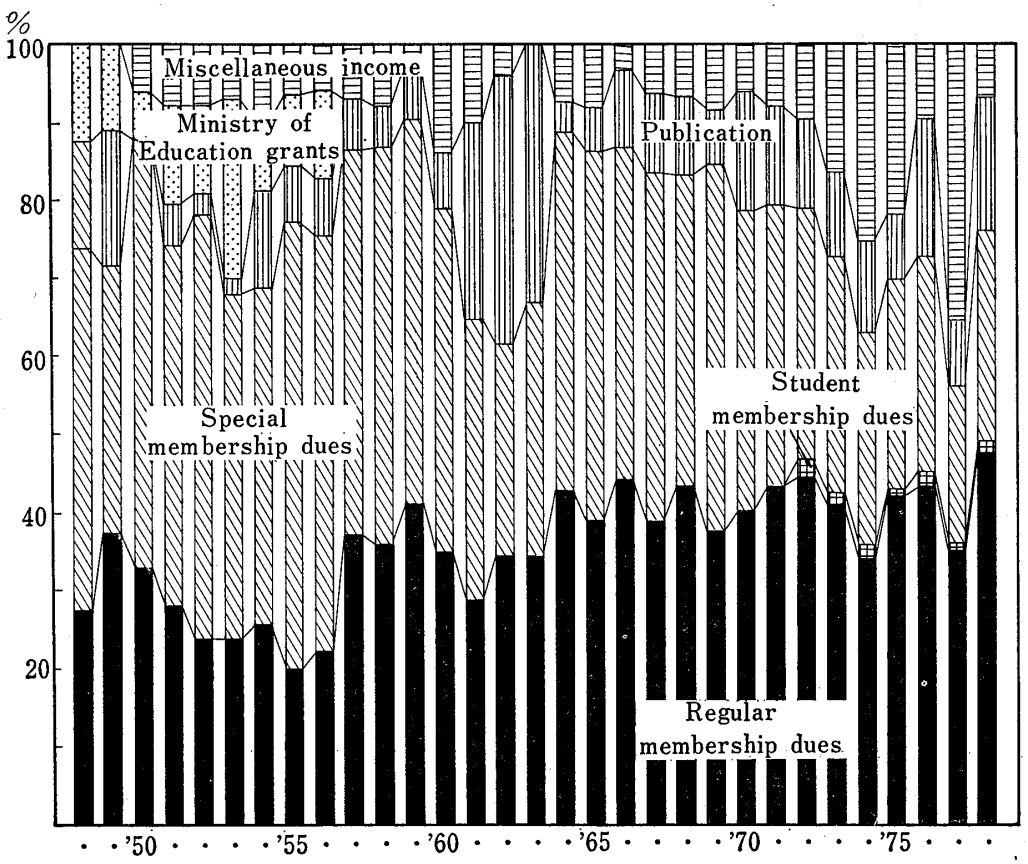

Fig. 3 Changes in financial characteristics of the SEG of Japan: Sources of income

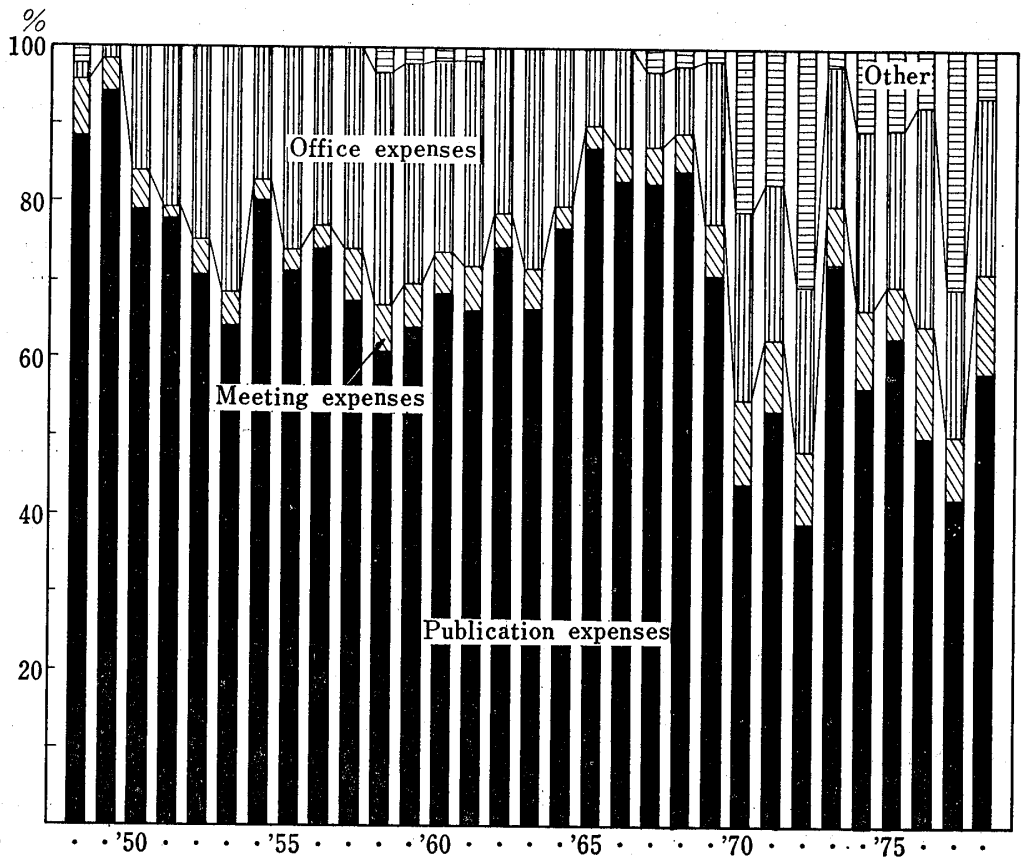

Fig. 4 Changes in financial characteristics of the SEG of Japan: Nature of expenditures

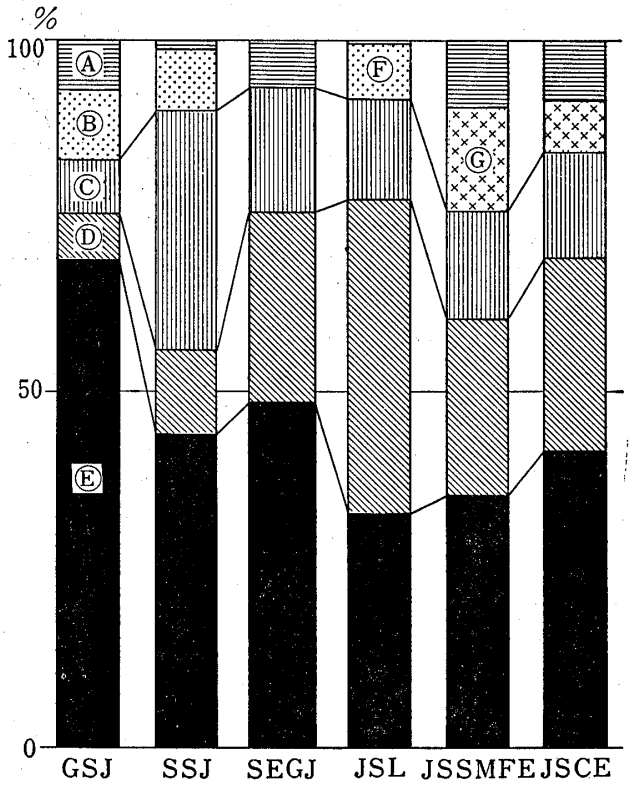

Fig. 5 Comparison of income sources for various societies GSJ: the Geological Society of Japan, SSJ: the Seismological Society of Japan, SEGJ: the Society of Exploration Geophysicists of Japan, JSL: the Japan Society of Landslides, JSSMFE: the Japanese Society of Soil Mechanics and Foundation Engineering, JSCE: the Japan Society of Civil Engineering
A: miscellaneous income, B: Ministry of Education grants, C: income from advertisements, D: special membership dues,
E: regular membership dues, F: the Japan Society of Landslide Prevention Technology grants, G: income from lectures, symposiums, etc.

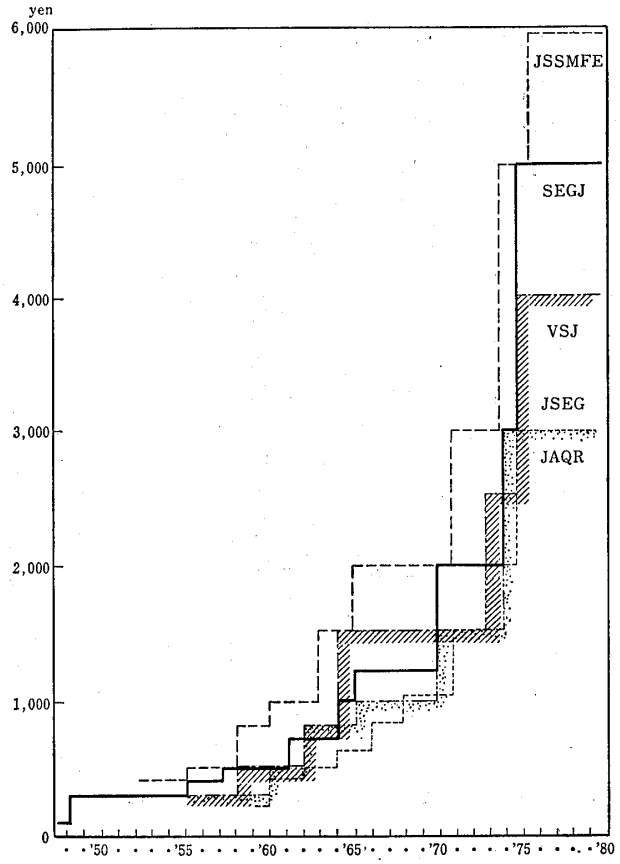

Fig. 6 Comparison of increase in dues of various societies JSSMFE: the Japanese Society of Soil Mechanics and Foundation Engieering, SEGJ: the Society of Exploration Geophysicists of Japan, VSJ; the Volcanological Society of Japan, JSEG : the Japan Society of Engineering Geology, JAQR: the Japan Association for Quarternary Research

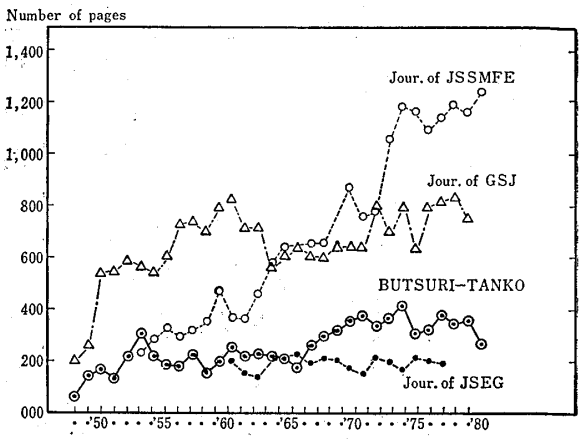

Fig. 7 Comparison of number of pages of journals of various societies

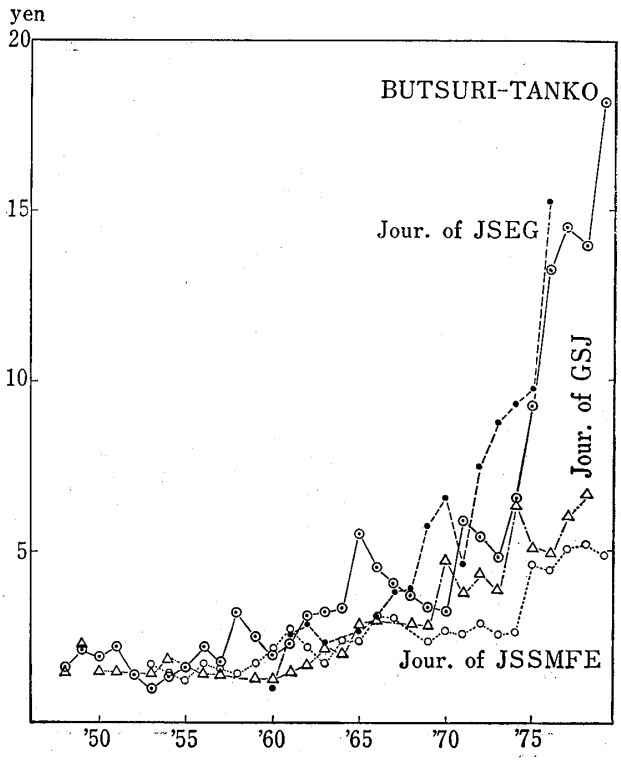

Fig. 8 Comparison of changes of price per page of journals of various societies

such organizations must naturally be planned in line with such activities and goals that are suitable for them. As I mentioned in my opening comments, management means to set a goal and to plan and continue activities to carry out that goal. Therefore, it is necessary to clearly identify the characteristics and goals of your society and carry out operations in such a way as to serve the regular and special members. However, I fear that the management of the SEG of Japan is not being carried out in such a way as to serve its regular and special members.

Figure 6 shows the progress of increases in membership fees in the SEG of Japan. With the one exception of the SSMFE, which has a substantial membership of 12,000, all the

other societies are on roughly the same scale. Of these, our own Society charges the highest dues.

Now, please refer to Figure 7. It shows the total number of pages published annually by the various societies. "The Journal of the Japan Society of Engineering Geology" publishes 200 pages; "Gepohysical Prospecting", 250 pages; "The Journal of the Geological Society ot Japan", 800 pages; "The Journal of the Japanese Society of Soil Mechanics and Foundation Engineering", 1, 200 pages.

Figure 8 shows the price per page of each of these journals. Because the SSMFE has a large membership, its journal would not serve well as a comparison. However, if we consider the "Journal of the Geological Society of Japan", which, like our own society, is basically scientific in nature, we find that its price averages about ¥7 per page, whereas our journal averages ¥18, or well over twice as much.

As members, I think it is important for us to deeply reflect on these facts that I have presented.

4 MEMBERSHIP OF THE SOCIETY

Figure 9 shows the changes that have occurred in the makeup of the Society since its founding, including the number of regular members and their affiliations. You will note that since 1970, about half of the members have belonged to consulting corporations who conduct site investigations as part of civil engineering and construction projects.

Figure 10 shows a breakdown of the membership. You will note that during the first 20 years in the life of the Society, the membership consisted largely of people belonging to academic and bureaucratic institutions and companies dealing with natural resources. Recently, however, the relative proportion of such members has drastically fallen off. This

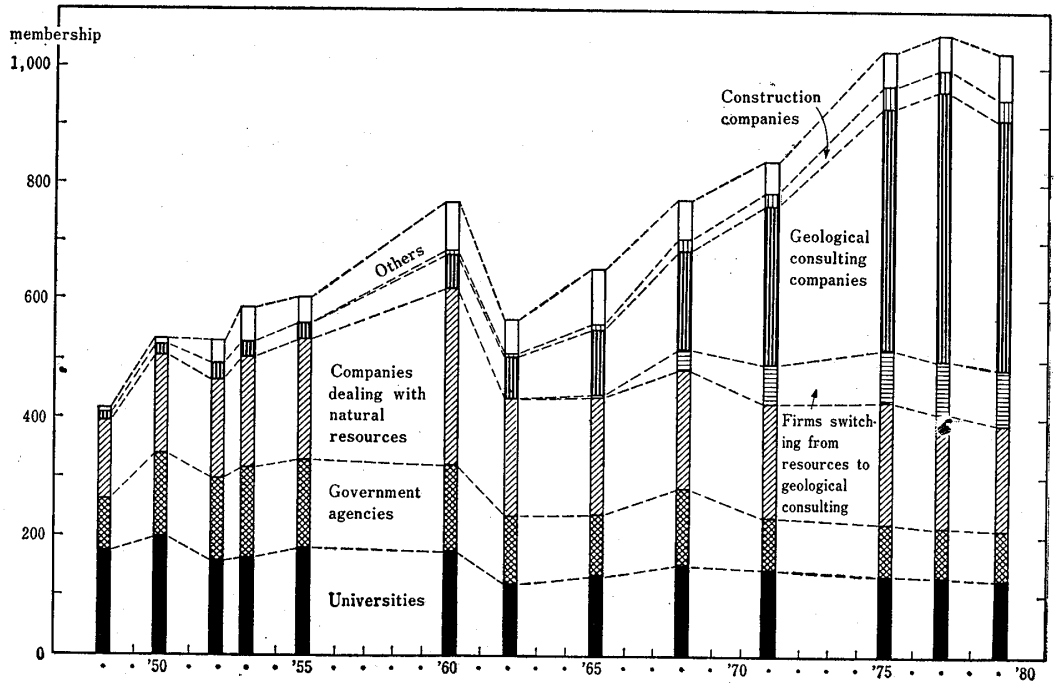

Fig. 9 Changes in relative proportion of organizations represented in SEG of Japan membership (by number of members)

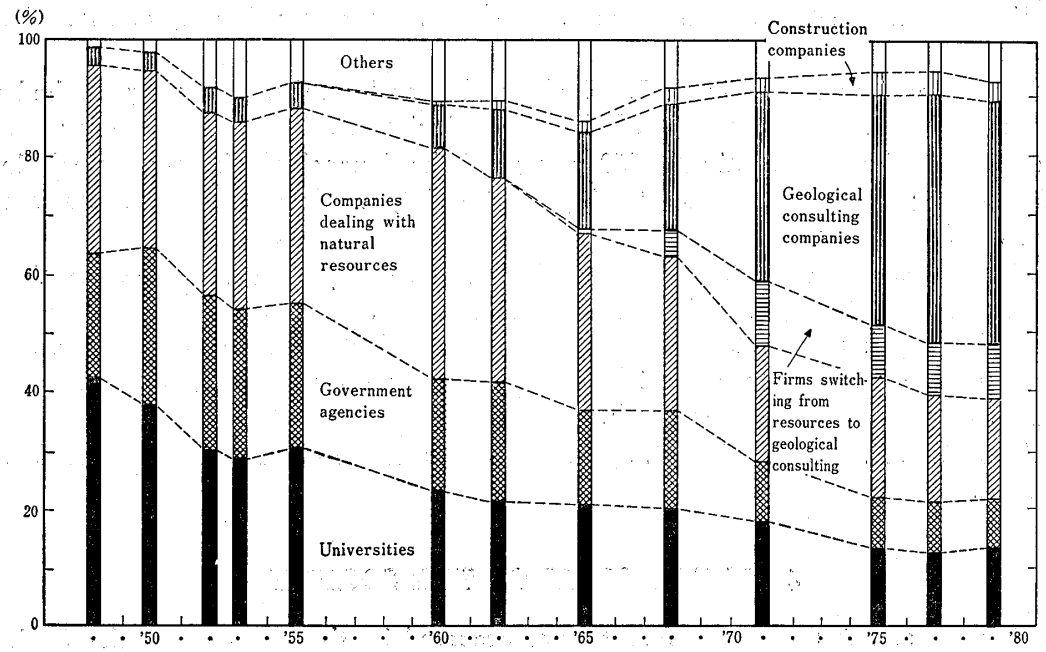

Fig.10 Changes in relative proportion of organizations represented in SEG of Japan membership (by percentage)

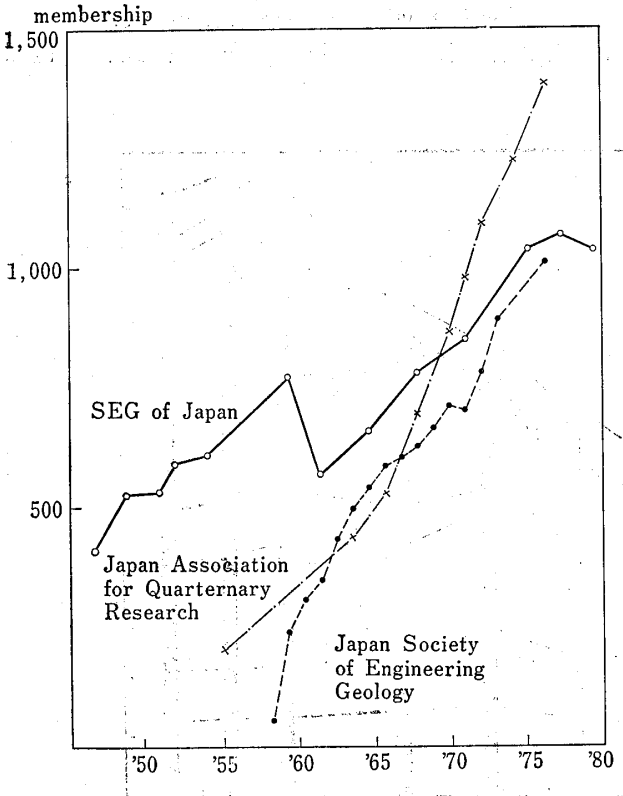

Fig.11 Comparison of changes in number of members of various societies

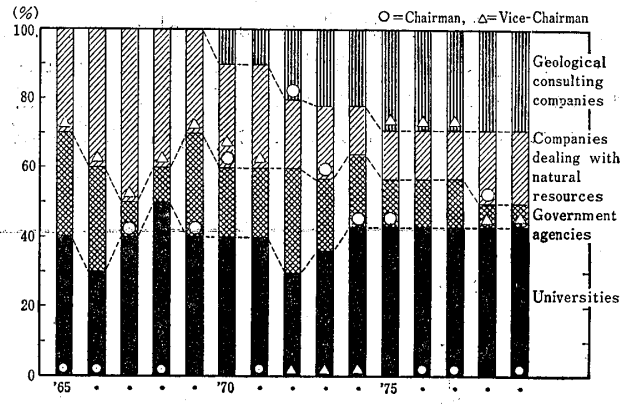

Fig.12 Changes in relative proporation of organizations represented among officers of SEG of Japan

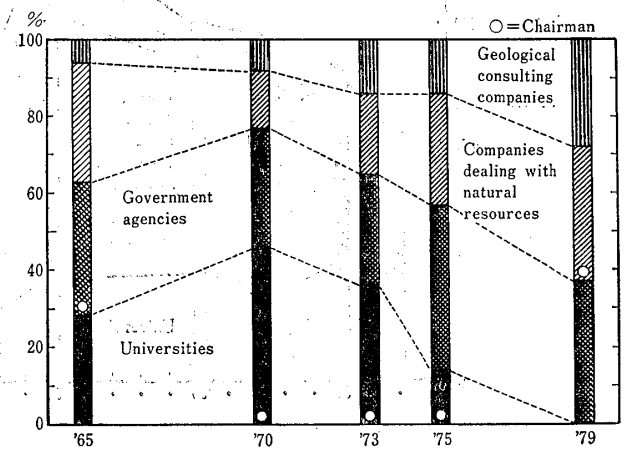

Fig.13 Changes in relative proportion of organizations represented among editorial staff of SEG of Japan

phenomenon is consistent with basic changes that have occurred in Japan's economy. Along with the development of Japan's industries, investment in construction has continued to expand greatly every year. Thus, in 1957, investments in construction amounted to ¥1.6 trillion ; in 1961, ¥3.5 trillion ; in 1965, ¥5.6 trillion ; in 1969, ¥15.5 trillion ; in 1973, ¥28.5 trillion ; in 1977, ¥37.9 trillion ; and in 1979, ¥48.2 trillion. The site investigation industry has naturally kept pace with these investments in construction. Thus, in 1962, 175 companies belonged to the Japan Federation of Geophysical Survey Enterprises, while the number has increased to 630 at present. And, I think you will appreciate that the changes in the makeup of the membership of the SEG of Japan have also changed in very close approximation of the overall trends of the Japanese economy.

Now, please look at Figure 11, which sows the changes in the membership of the SEG of Japan in comparison with other societies. Three societies that are roughly the same in size were selected for comparison: The Japan Association for Quaternary Research, The Japan Society of Engineering Geology and the Volcanological Society of Japan. You will note that the SEG of Japan is now experiencing a period of stagnancy in membership growth.

Figure 12 shows a change in trend of the background of the officers of the Society. We note no great changes with the 40% of officers with academic connections. However, in recent years, there has been a considerable falling off in the number of individual members belonging to government agencies or companies connected with mining. At the same time, geological consulting companies have made their appearance since about 1970. At present, such companies comprise 30% of total membership.

Next, Figure 13 shows the state of the editorial staff of "Geophysical Prospecting", the publication of which accounts for 60% of total expenditures. Editorial staff members with academic affiliations were present until 1978, but now not a single such individual remains. As you know, the putting together of a journal requires a great deal of time and effort. What have we to make of the fact that not a single university professor today remains carrying out this job? I am afraid I cannot give you an answer I might, however, suggest that those university professors among us should spare us more of their efforts.

5 THE JOURNAL OF THE SEG OF JAPAN ("GEOPHYSICAL PROSPECTING")

Next, I would like to analyze the content of "Geophysical Prospecting" from various angles.

Figure 14 shows the number of papers presented each year, arranged according to the organization to which the contributors belonged. Figure 15 shows the same information in percentages. You will note that this year about 60% of contributors belong to universities, 25% of contributions came from either people affiliated with governmental agencies or companies dealing with natural resources, with the remaining approximately 15% being members of geological consulting firms.

Figure 16 analyzes various aspects of the 591 papers that have appeared in "Geophysical Prospecting" from, Volume 1 through Volume 33. Figure 16(1) shows topics arranged according to the organizations to which the authors belonged. Contributors from the academic world represent 46% of all contributions; government agencies, 24.5%; companies dealing with natural resources, 17.1%; and geological consulting firms, 8.6%. Figure 16(2) is a breakdown of prospecting methods with which the papers were concerned. 44.5% were concerned with seismic prospecting; 34.0%, with electrical; 5.8% with gravometric; 2.7% with logging; 4.1% with magnetic; 4.9% with either radioactive or temperature; and 2.0% with electromagnetic prospecting.

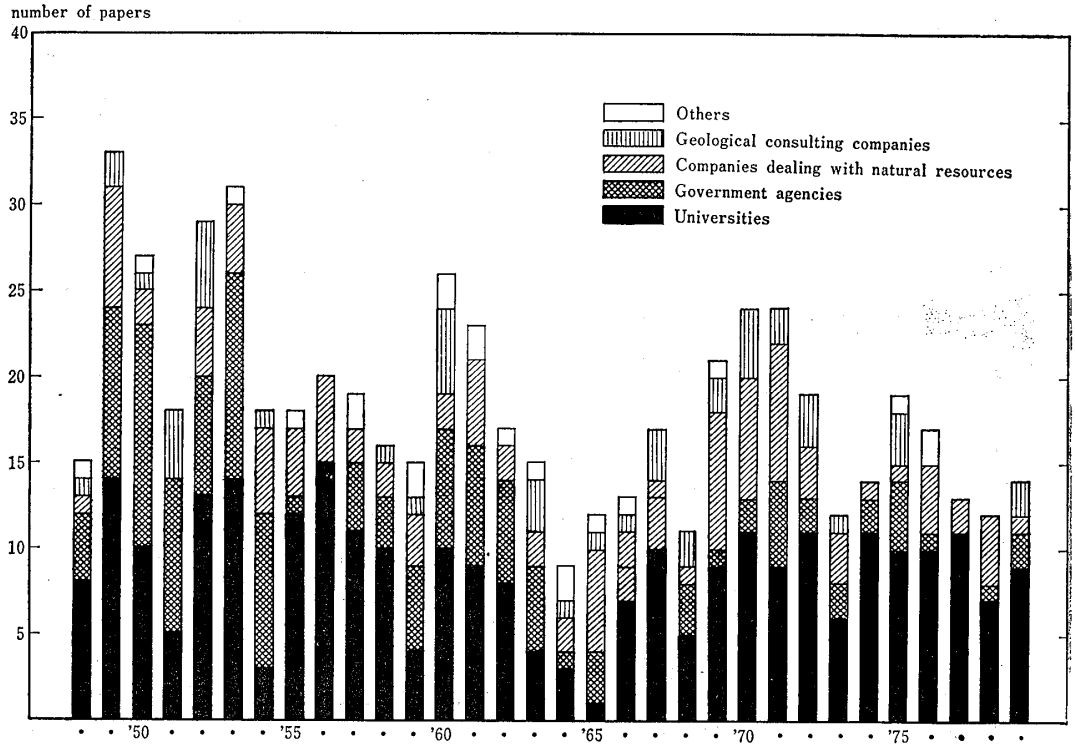

Fig.14 Changes in relative proportion of organizations represented among contributors to "BUTSURI-TANKO (Geophysical Prospecting)" (by number of contributors)

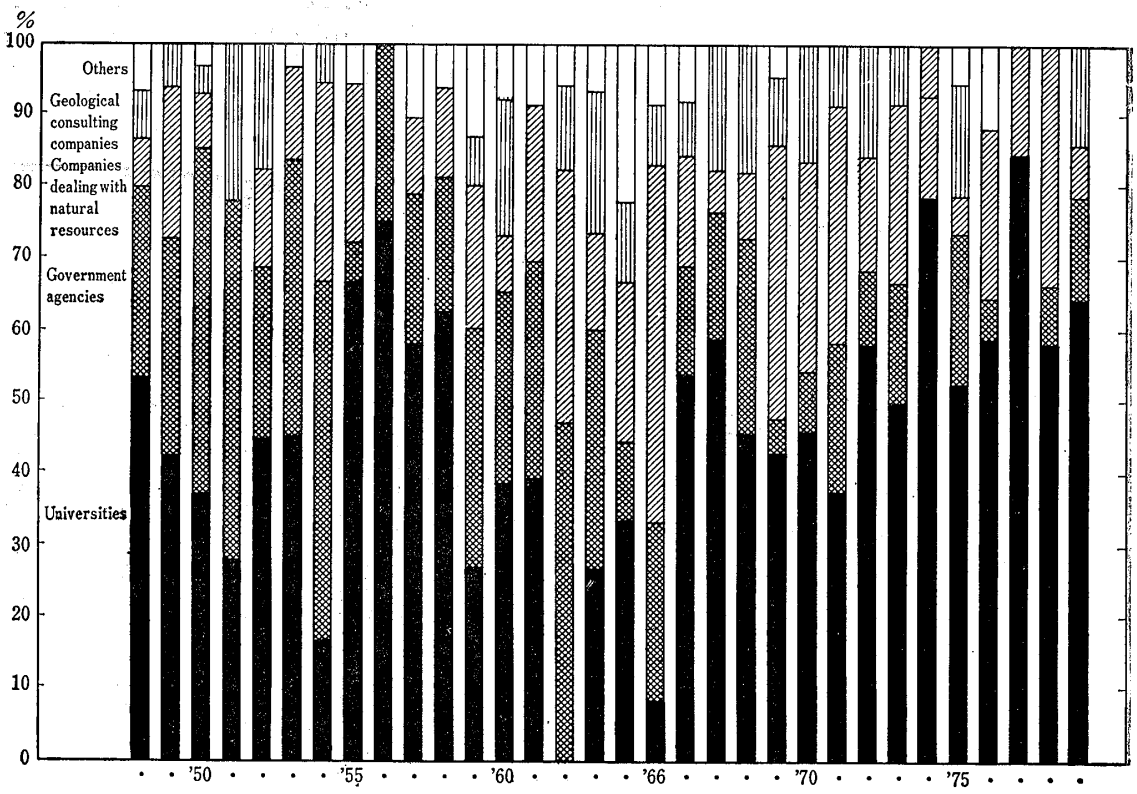

Fig.15 Changes in relative proportion of organizations represented among contributors to "BUTSURI-TANKO (Geophysical Prospecting)" (by percentage)

Seismic and electrical methods, taken together, account for 78.5% of the total. Of these two methods, Figures 16(3) and 16(4) show the breakdown of the backgrounds of authors of papers on these two prospecting methods. You will note that in Figure 16(4), university professors making contributions amount to 55%; government agencies, 22%; and geological consultants amount to a mere 2.0%. The significance of this latter figure is that electrical methods are not generally used in civil engineering site investigations. However, in the field of seismic prospecting, you will note that people from geological consulting firms made 16% of the contributions: such firms rely very heavily on the use of seismic prospecting methods. In Figure 17, we see the changes over the years in the relative concern of "Geophysical Prospecting" with different prospecting methods. Figure 18 shows a similar analysis for articles that have appeared in "Geophysics". Comparing the two publications, we see a variety of methods, especially electromagnetic, represented in "Geophysics", while "Geophysical Prospecting" has been concerned mainly with seismic, electrical and logging methods. Another notable feature is that in "Geophysics", the number of papers appearing has increased with the years, while we note the opposite tendency for "Geophysical Prospecting". Here too, there is a suggestion there is some problem with the management of the SEG of Japan.

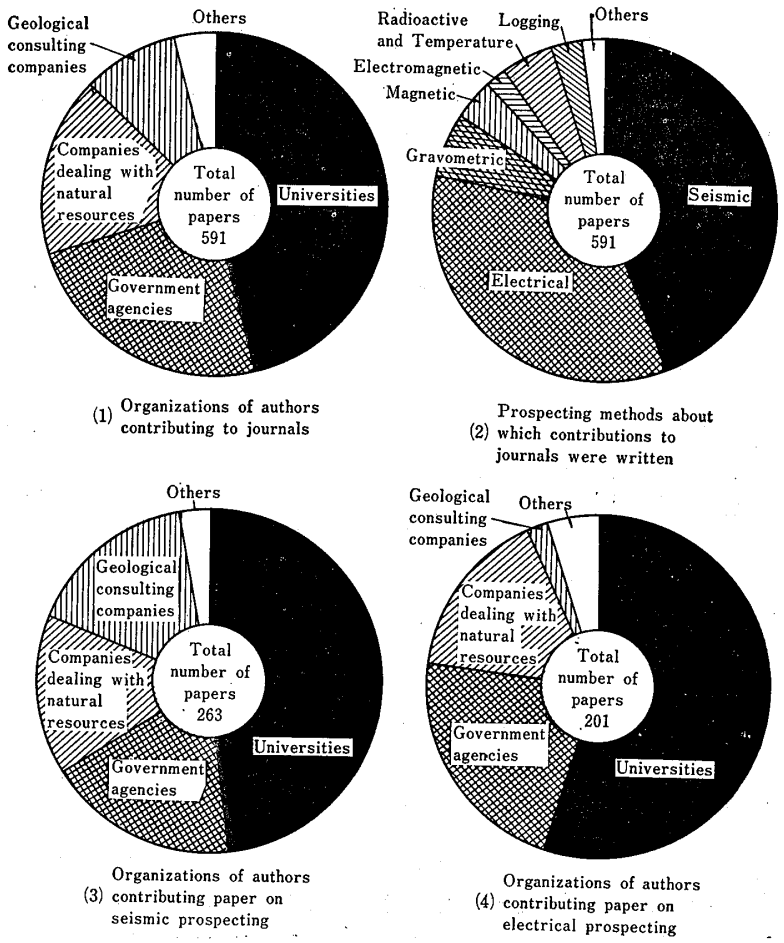

Fig.16 Analysis of papers appearing in "BUTSURI-TANKO (Geophysical Prospecting)" from Vol. 1 (1948) through Vol. 32 (1979)

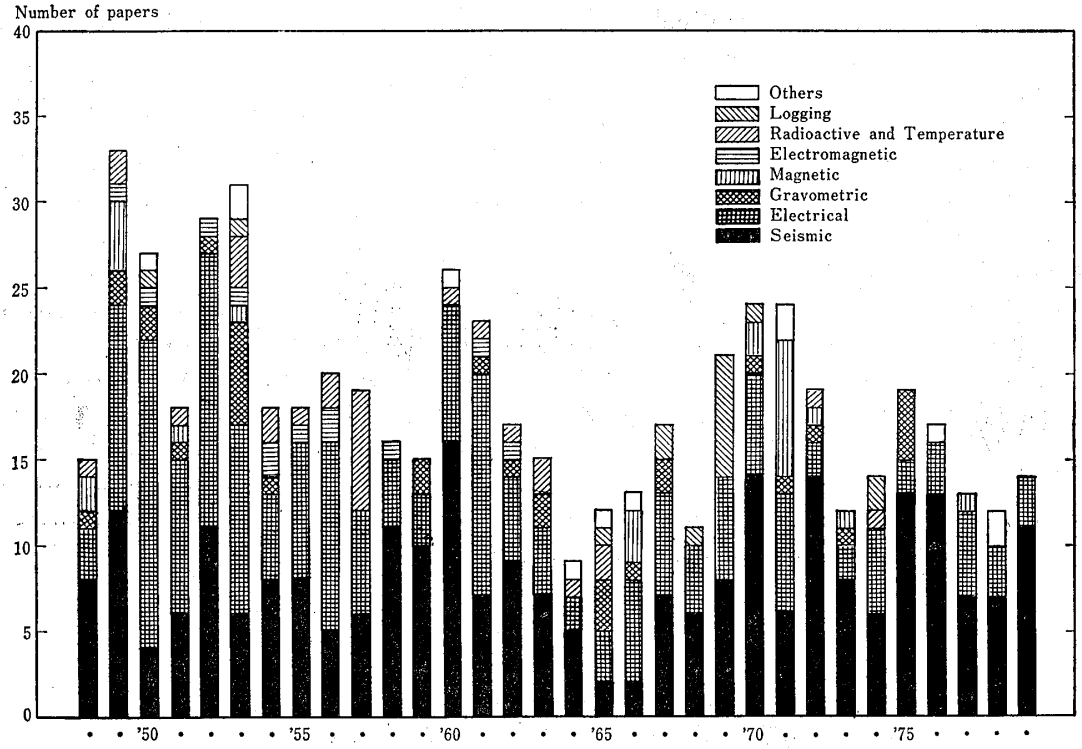

Fig.17 Changes in content of papers submitted to "BUTSURI-TANKO (Geophysical prospecting)" (by which prospecting method each paper was concerned with)

6 EXPECTATIONS FOR THE SEG OF JAPAN

Let me return once more to Figures 9 and 10. As you know, these graphs show that the number of civil engineering firms and geological consultants has increased dramatically, reflecting the changes in the economy. I have suggested that these changes in membership necessitate changes in the management of the SEG of Japan.

What sort of expectations for the Society do the civil engineering and geophysical consultant members have? Although such members comprise over half the total membership, they are not heard from very often. What indeed do these members desire?

Let me give one concrete example. I think that this chart (Figure 19) is a representative example of the desires of these members. It represents the present state of procedures for analyzing dynamic deformation characteristics and other ground characteristics. On the right are the techniques that many concerned engineers have expressed a desire to use in the future.

Here we have a bird's-eye view of the various tools used in the field and in the laboratoty to explore the geophysical makeup of the ground: Young's modulus E, rigidity factor G, Poisson's ratio ν, damping factor h, etc. A signal is passed through a given medium and the response shown by that signal analyzed. There are many testing methods for accomplishing this. The field of soil mechanics has shown remarkable progress in recent years. As the diagram shows, such methods as dynamic triaxial testing, dynamic simple shear testing and dynamic torsion testing have all been put to practical research use. In addition, thanks to the research done on resonant column testing by Dr. Kumiji Iida when he belonged to the Earthquake Research Institute of Tokyo University, this method has once again come into common use.

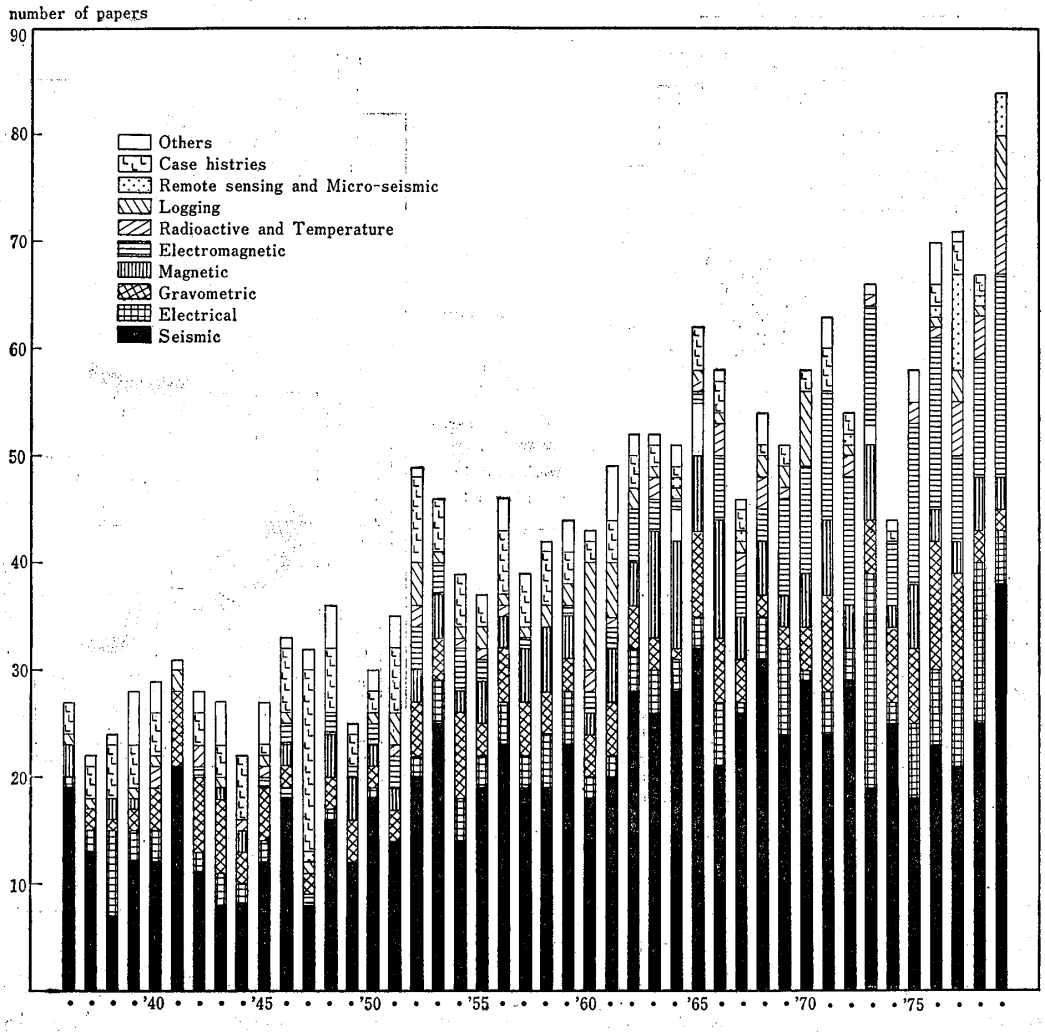

Fig.18 Changes in content of papers submitted to "Geophysics" (by which prospecting method each paper was concerned with)

Each of these test methods differ according to the way in which dynamic loads are applied, frequency of dynamic loads, stress conditions at the time of testing and strain levels. The characteristics determined accordingly are complex, changing factors.

Prominent in situ prospecting methods used are seismic methods. In addition to their objective of determining ground structure, seismic methods tell us various physical properties of the soil and rock layers composing the ground. It is therefore hardly necessary to emphasize the importance of seismic methods in site investigations. Seismic methods are useful not only in investigations for natural resources, but for engineering purposes as well, they play a very important role and are constantly being perfected. The various seismic methods include surface refraction, *PS*-logging in boreholes, and the recently developed Suspension *S*-wave logging method. All of these methods involve methods of measurement of propagation of body waves (*P*-waves and *S*-waves). *P*-wave velocity *Vp* and *S*-wave velocity *Vs* are determined on the basis of travel time curves and values for velocity distribution on the ground are calculated. As you know, if *Vp* and *Vs* are known, the dynamic properties E, G and ν may be determined. Recently, besides travel time analysis, the determination of seismic loss or the factor known as Q (appearaing in the chart in the formula $h=1/2Q$), which is related to damping factor h, is determined by spectral analysis. Q corresponds to h, which is obtained on the basis of the

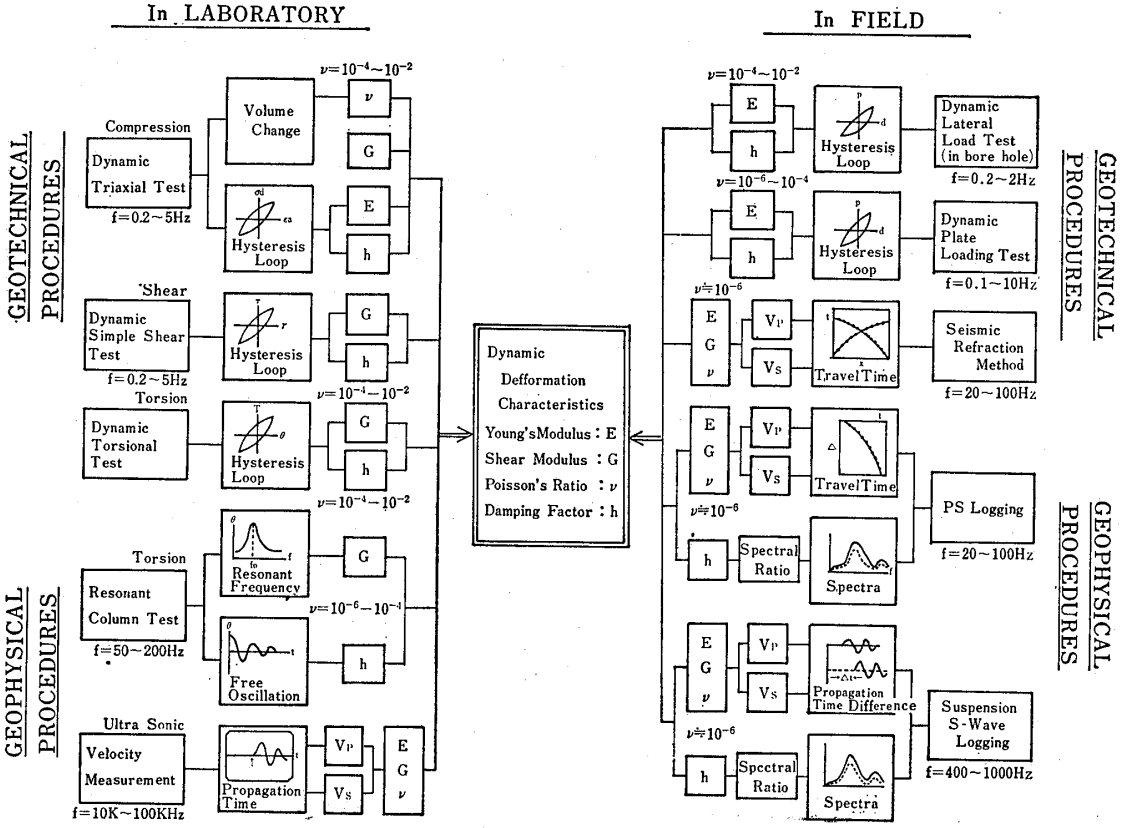

Fig.19 Procedures for identifying deformation characteristics

area occupied by a hysterisis loop. These factors, Q and h, are extremely important factors in earthquake engineering and vibration engineering.

Next, let us turn to Poisson's ratio. As we see from the diagram, we find Vp and Vs in the laboratory with ultrasonic velocity measurement and determine Poisson's ratio according to elastic theory. In the same way, this value may be determined on the basis of Vp and Vs in situ measurements. In addition, OYO Corporation's engineering department has designed a way of measuring Poisson's ratio in a triaxial testing apparatus equipped with a double cell capable of measuring volume change. Values for Poisson's ratio determined by different testing methods will not necessarily always agree. This is not at all surprising. Soil is not an ideal elastic body, but a medium made up of particles, water and open spaces. But what is the significance of this value, sometimes defined as the ratio of P-wave velocity (a value thought to depend largely on water compressability) to S-wave velocity (a value determined by the spaces between soil particles)? From the standpoint of overall soil dynamic characteristics, we may define Poisson's ratio as the ratio of longitudinal strain to transverse strain. Can these two methods of determining Poisson's ratio be made to agree? What would be the case under unsaturated conditions?

The dynamic deformation characteristics of soil of which I have been speaking are the most important and the basic data in civil engineering, in earthquake engineering and in related fields for design and simulation purposes. Yet at the same time, there is much about these factors that is not known, and there are no simple answers. The nature of soil changes according to different conditions. We could well describe our ultimate objectives as being to arrive at a uniform dynamic theory to describe the overall structure of soil. For this purpose, as shown in the diagram, we are taking both the geophysical and geotechnical approaches, both ot which must be coordinated together.

In the above, I have given an example involving dynamic soil deformation characteristics. Beyond this, we have similar problems with strength characteristics. I have not given a diagram to illustate this, but here too, we have many unknowns and problems requiring much serious research. In addition to the above, there is one more extremely important procedure that must not be overlooked when describing ground characteristics. This is to carry out careful in situ geological observations. As anyone who has observed a natural outcropping formation can testify, natural formations are extremely complex things. Rock layers are composed of a variety of rocks and minerals, possessing cracks and different kinds of structures. Figure 20 gives a typical example of the complexity of formations.

This formation cannot be considered a simple isotropic homogenous layer. While alluvial layers are generally taken to be homogenous in the field you can see upon close observation that even alluvial deposits contain clay, sand seams, silt, etc.. Natural formations must, then, be thought of as irregular, heterogeneous bodies. In actual practice, it is natural that within certain limitations, calculations must be based on the assumption that the formation is homogenous. When it comes to actual structural design, the true nature of then ground must then be taken into account in making engineering decisions.

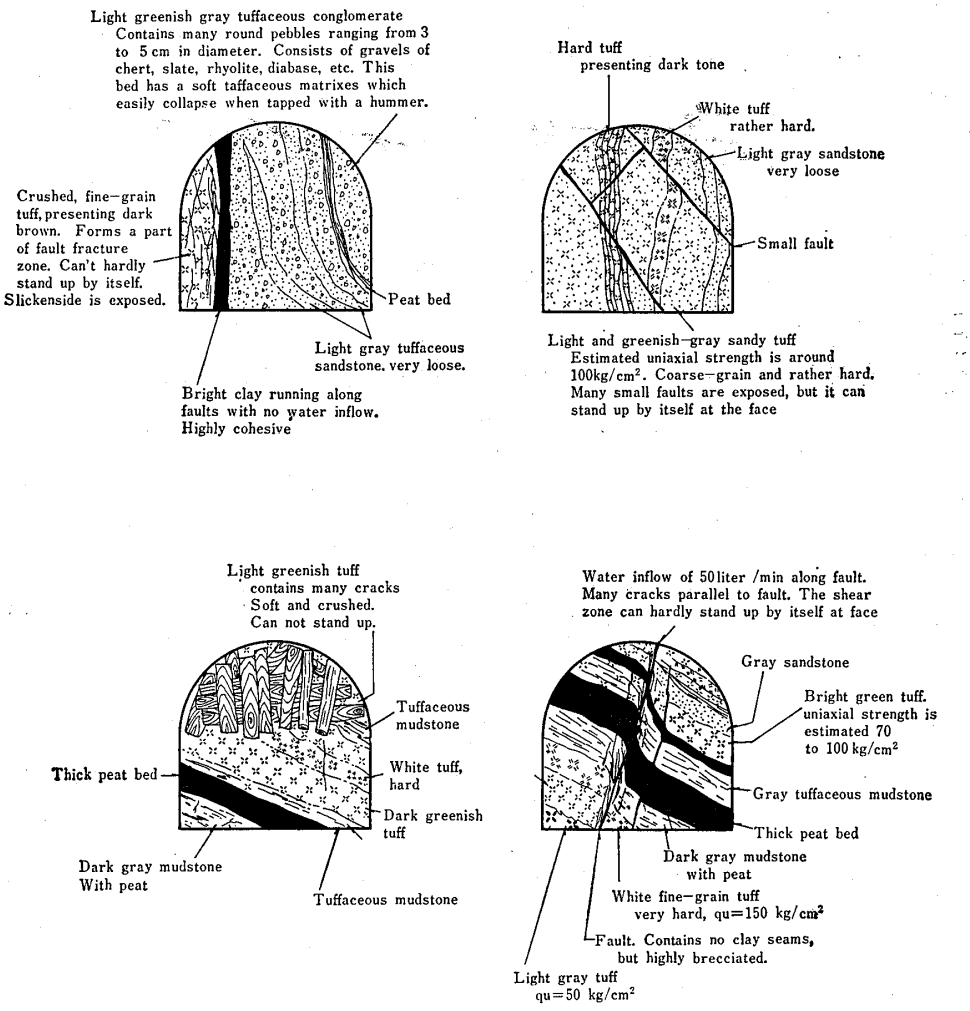

Fig.20 Some sketches of tunnel faces to illustrate makeup of layers

In any case, I would like to emphasize that it is extremely important to use both geophysical and geotechnical methods based on an awareness of geology in correctly describing ground formations.

It is my hope, along with all of us who are involved in civil engineering, that the SEG of Japan will take the lead in opening the yet undeveloped area that exists between the geophysical and geotechnical fields.

7 LESSONS FROM THE PAST…LEARNING FROM OUR PREDECESSORS

In preparing for today's talk, I took the opportunity to study a number of valuable articles : The introduction to the first issue of "Geophysical Exploration" (June, 1948), and the article,"Geophysical Mining Exploration In Japan : Prospects and Recollections" in the same issue ; Volume 23, No.1 (February, 1970, "New Directions For the SEG of Japan" by Junsuke Chujo and Kanenori Ichikawa ; Volume 27, No.2 (November, 1973), "Geophysical Prospecting : Reflections and Outlook", by Kumiji Iida ; Volume 33, No.2 (February, 1980), "A Short History of the Society of Exploration Geophysicists of Japan", by Yoshihiko Ono. Perusing these articles, there is one thing that I became acutely aware of, i. e., that there is no need to engage in a debate over the best way to develop the SEG of Japan. We need only return to the words contained in the introduction to the inaugural issue of our journal to accomplish this. Let me read from this introducton, which contains all that I wish to say :

"…Our active development lies in the extensin of exploration techniques, not only for the location and identification of ore, coal and oil deposits, but site investigations for structures, underground water and hot springs." This quotation clearly shows that our predecessors were looking to the broad development of the field of geophysical prospecting from the first issue of the journal. The objectives that were held at the founding of the SEG of Japan are given as follows :

"In order for us to emerge from the limited post-war environment of our country, with its dearth of natural resources, and create our own tradition within the world community, we must abandon the type of site investigation research in which individuals work without any mutual interchange. We must join together in exchanging information, engaging in discussions where opinions are aired freely. We must form organizations for the progress of learning. It is with this awareness that we have gathered together like-minded men to form this Society."

It was our predecessors' intention to develop geophysical prospecting methods in such a way that they would be useful in various industrial fields. They were deeply aware from the start of the need for scholarly research, admonishing us that we must abandon the type of site investigation research in which individuals work on their own and join together in exchanging information, engaging in discussions where opinions are aired freely. Does this not continue to be our greatest need now, in 1980 ? I can say that in my own field of work, geologists, geophysicists and civil engineers have a great respect for one another's work and are joined firmly together in pursuit of research for the study of the physical properties of the earth.

My fellow SEG of Japan members : Look to the past to learn about the present. Study the words of our predecessors. Let us return once more to the spirit behind the founding of our society. Listen to the words written at the founding :

"There are several foreign magazines dealing with geophysical prospecting. Especially notable are the high standards set by the American publication, "Geophysics" with which we have extensive connections. It is the aim of this journal to attain this level as our minimum goal, and then to continue progress to elevate that standard. It is our desire to make progress in our own field, and at the same time to act as a stimulus to progress in related fields."

My fellow members: It was our predecessors' intention to attain this level as our minimum goal, and then to continue progress to elevate that standard. They aimed for the SEG of Japan to take the lead in the field of geophysical prospecting. Can we say that we of the present era have such lofty ambitions?

The introduction to the first issue of "Geophysical Prospecting" also touches on matters that fall under the heading of management: "It is our intention to include in this journal not only theories, reports and debates on physical and chemical research carried out by our members, but to comprehensively include material on all aspects of the affairs of the SEG of Japan, résumés of literature within and outside of the field for the purpose of maximizing the usefulness of this material." This represents a truly admirable set of aspirations.

This year, we have adopted a new name for our organization. On this occasion of a new beginning, I believe that the article, "Geophysical Mining Exploration in Japan: Prospects and Recollections", that appeared in the first issue of our journal be required reading for each and every member. I think that this article has the answer to the question of how we should chart our course hereafter. At the time of the writing of this paper, a number of university professors took the lead in gathering together researchers and engineers from academic circles, government agencies and other sectors. Their achievements are vividly described. In this area, I think that there is a great difference between that era and the present.

Now, if I may turn to another topic, I have for several years attended the annual meetings of the Society of Exploration Geophysicists, as well as those of the European Association of Exploration Geophysicists. I have attended many of their meetings and exhibitions, watching and listening. From that experience, I would like to tell about two very interesting aspects of these organizations.

The SEG has a unique tradition of awarding prizes to outstanding presertations. The "Outstanding Presentations Awards" are scored on the following points: (1) delivery; (2) clarity; (3) graphics; (4)timing.

JUDGING STANDARDS
FOR
OUTSTANDING PRESENTATION AWARDS

PLEASE NOTE that papers devoid of significant technical content are not eligible for these awards. Among papers that are to be excluded from consideration are political discussions, travelogues, and advertising pitches.

Delivery

3 points——Clearly spoken.
Loud enough to be heard in the back of the room.
At most an occasional and unobtrusive look at notes.
Avoids long words and specialized jargon.
Timing and emphasis varied as appropriate.

2 points——Clear delivery.
Some hesitation or repetitiveness.
Frequent use of notes or text.
Occasionally inappropriate vocabulary.

1 point ——Monotonous delivery.
Most of talk read from text.
Inaudible in parts of room or from time to time as distance varies from microphone.

0 points——Droning delivery.
Totally read from text or mumbling and incoherent, mostly inaudible (but who cares).

Clarity

3 points——Talk organized into rational sequence of sections.
Each new idea clearly stated.
Purpose or aim of underlying work clearly stated.
Clearly phrased conclusion.
Contains no unnecessary detail (e. g., equations, tabular material).

2 points——Purpose of work clearly stated.
Conclusion reached and intelligibly expressed.
Generally well organized.
Little or no unnecessary detail.

1 point ——Has some narrative continuity.
Purpose and conclusion can be deduced from material presented.
May contain irrelevant or unnecessary detail.

0 points——Incoherent rambling or recitation of minutia or detailed irrelevancy.
(What was he talking about?)

Graphics

3 points——Slides or other graphics can be read clearly from any place in audience.
No unnecessary text or material on any slide.
Each slide has a single, clear message.
Color is unobtrusive or forms part of the message.
Equations are at an absolute minimum and not more than one or two to a slide.
No tabular material.
There are enough slides and not too many.

2 points——Slides can be read from any place in the audience.
Slides are generally uncluttered.
Each slide has one basic message.
Equations are at a minimum.
No tabular material.
There are about the right number of slides.

1 point ——Slides can be read from most places in the audience.
The message or messages on each slide can be discerned.
Equations are few.
It is hard to tell if more or fewer slides should be used.

0 points——Slides cannot be read from most parts of the audience.
or Slides are too cluttered or too small-scale to be understood.
or Several slides display sets of equatins.
or Several slides display tables of numbers.

Timing

1 point ——Presentation was completed on time or not more than one minute overtime.
0 points——Presentation ran more than one minute overtime.

I don't think I am the only one who notes a certain youthful energy behind this award-giving tradition.

Another interesting area concerns exhibitions. As you know, the SEG is a very large organization that gathers together somewhere in the area of 6,000 people at its yearly meetings. In addition to presentations, large-scale exhibitions are held. It provides a place for the instruments made by any corporation to be show to large numbers of interested people. There is a set of rules that gorverns the exhibition of instruments with a system of awarding points for such contributions to the SEG as advertising in "Geophysics", etc. . I would say that there is much to be learned from this system by which speakers and participating corporations are given incentives. It can be easily understood how the SEG has managed to expand and become more active year by year.

8 IN CONCLUSION

The first Chairman and one of the founding fathers of the SEG of Japan, Dr. Kumiji Iida, wrote the following in Volume 27, №2 of our journal, in the paper entitled, "Geophysical Exploration : Prospects and Reflections" :

"The change from focus of 'Geophysical Exploration' from underground resources at the founding of the SEG of Japan to the present focus on civil engineering and other fields involving construction and disaster-prevention investigations has made me acutely aware of the passage of time. The degree to which investigation research results have spread to include a variety of fields can be inferred from this shift. However, I can only regret the fact that as this issue begins our sixth volume of publication, the number of papers has decreased somewhat."

On the matter of the failure of Japan to keep pace with the world development of prospecting instruments, Dr. Iida comments, "A new generation of instruments has appeared, giving engineers invaluable experiences to aid in the advance of the science of prospecting. There is no question that the appearance of valuable equipment and the enriching of the experences of engineers has greatly increased the effectiveness of geophysical prospecting in Japan. However, a look at recent history shows that we have become greatly dependent on developments from abroad. It is up to Japan to deal with and solve the many problems obstructing the development of our own technology."

Dr. Iida has the following to say concerning the importance of interdisciplinary research :

"The physical structure of ground formations in Japan are complex. Likewise, the information gathered from ground investigations are similarly far from simple. Consequently, geophysical prospecting methods alone are not enough to completely solve all problems. While geophysical prospecting methods have their self-contained limitations, I believe that by cooperating closely with those in field related to our own, and through continued effort, further progress and development can be achieved. It is my hope that in this way, the field of geophysical exploration in Japan will quickly realize the goal of independence."

I believe that these farsighted words of Dr. Iida really point to the path that Japan must follow. Finally, Dr. Iida offers the following advice to the members of the SEG of Japan :

"Faced with this reality, in order to realize substantial progress in the 1970's, first, we must establish a much more academic background to our activities··· and secondly, the improvement of the quality of the SEG of Japan is required. As a society concerned with underground exploration in related fields, we must increase its attractiveness, particularly to our younger members. The drastic step of changing the name of the society is to be recommended. It is up to the SEG of Japan to establish firm academic connections within and outside the country order to develop it into a largescale organization."

I think that no one has any opposition to the new start the SEG of Japan has taken this year (1980) by renaming the Society in accordance with the recommendation of Dr. Iida.

(Underlined portions are additions of the author and are not found in the original text.)