

n e w s l e t t e r



Faculty of Engineering, Kyoto University

京都大学工学部国際交流ニュースレター

October 1995 No.5

Reform of the Faculty of Engineering and its Future



Naohiro SOGA

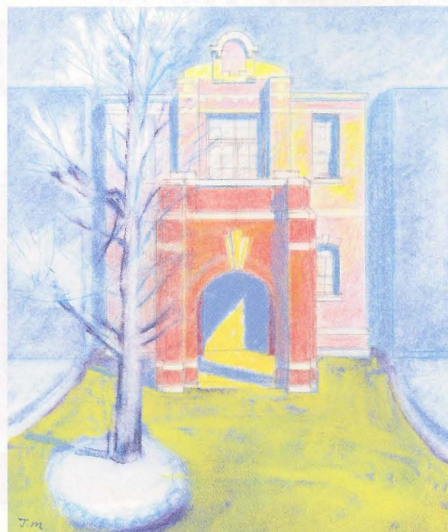
Dean,
Faculty of Engineering

In April, I took the Dean's position in the Faculty of Engineering, for a term of two years, succeeding Professor Kazuyoshi Nishikawa. For the past several years, I have been in charge of selecting foreign students for various scholarships and fellowships at the Faculty and University levels. Thus, some of the readers of this newsletter may recognize me by the photo shown above.

As you might have heard from your friends in Kyoto University, our Faculty is now in the process of restructuring. Our main objective is to give more emphasis on graduate education, but we are by no means taking lightly our undergraduate education. Rather, we plan to chart the present course of undergraduate education from narrow professional areas into more broad and fundamental areas, so as to prepare students for highly specialized or interdisciplinary fields in graduate school. We started this reform in the field of industrial chemistry field in 1993, and followed with the field of engineering science in 1994, the field of electrical and electronic engineering and the field of informatics and mathematical science in 1995. We expect to complete it by reforming the fields of civil engineering and architecture next year. Thus, the Faculty of Engineering will consist of these 6 large departments, reduced from the previous 23 departments; they may be called "schools" after 1996.

As for the Graduate School, the number of graduate divisions remains at 26, but new divisions, which will be called departments after 1996, are formed by shifting several laboratories (Kozas) from the previous divisions and combining two or three Kozas into one group (Dai-Koza). This was done in order to create more flexibility in faculty appointments and research activities. In addition to these groups, a special research laboratory (Sennin-Koza) is being created in each department to promote more advanced research projects and strengthen our Ph. D program. These laboratories accept Ph. D. candidates from industrial laboratories.

The University has responsibility to society for providing high quality education to prospective students and carrying out research for future needs. As for research, our faculty members have been very productive, as one can see through their achievements shown in the annual publication "Kogaku Kenkyu (Engineering Research Report)". This report lists more than 2,000 papers, three-fourths of them written in English and published in international and domestic journals. However, recent advances in science and technology are so fast and so widespread that the current organizations in Kyoto University, which were formed according to the traditional divisions of scientific disciplines, are facing difficulties in accommodating societal needs. Our attempt at reform is to adapt ourselves to these needs, but it may not satisfy all of them because we are also responsible to turn out well-educated and capable students who will be actively involved in engineering research and development. Thus, Kyoto University has set forth a future plan of creating new graduate schools of an interdisciplinary nature. The first one planned is the Graduate School of Energy Science. Since "energy" is one of the important areas of study in engineering, our graduate school has to play a major role in establishing this new school. By supporting this University plan and encouraging a number of our faculty members to join the new interdisciplinary graduate school, I believe that our Faculty will benefit greatly, not only in giving our engineering students a broad education, but also in enhancing cooperative, interdisciplinary research activities.



International Hall, Faculty of Engineering

ゲルノーブル理工科大学—INPG—



橋本 敏

機械物理工学教室助教授

Institut National Polytechnique de Grenoble (INPG) と本学部との協定は1991年に締結されました。フランス・アルプスの観光と登山、そしてウィンター・スポーツの基地としてなじみの深いゲルノーブル市は革命当時は人口2万の町でしたが、19世紀後半に製紙、水力発電、金属工業が興り、今世紀に入ってから電気冶金、電気化学工業の発展に支えられ、現在のこの町のキー・ワードと問えば「ハイテク」、パリに次ぐ科学技術研究都市として周辺の町を含めると人口50万を擁する活気に溢れた町です。

パリから TGV で3時間、駅前の停留所から音も立てずに滑り出すトラムに乗ると医学・薬学系大学とその付属病院を経て15分で大学のキャンパスに着きます。1968年冬期にはオリンピック村として供された広大な土地は緑が豊富で、ここからのヴェルコール、シャルトルーズ山地、冠雪したピークを連ねるベルドヌ山脈の眺めは素晴らしいものです。

INPG はパリに集中するジェネラリスト養成校としての伝統的グランゼコール（エコール・ポリテクニク、エコール・サントラル、エコール・デ・ミン等）とは異なる新しいタイプのポリテクニクで、以下に示す8つのエコールから成り電気化学・冶金、電子、経営、機械・流体、電気、情報・自動制御、材料、製紙・印刷工学の分野をカバーしています。

Écoles Nationales Supérieures:

d'Électrochimie et d'Électrometallurgie

d'Électronique et de Radioélectricité

d'Génie Industriel

d'Hydraulique et de Mécanique

d'Ingénieurs Électriciens

d'Informatique et Mathématiques Appliquées

d'Physique

École Française de Papeterie et des Industries Graphiques

これらのエコールの第1学年に入学するためには、リセを終えて全国共通の資格試験（バカロレア）で一定以上の成績を取ったあとグランゼコールの準備クラスで2年間、数学と物理を勉強し選抜試験に合格しなければなりません。なお、エコールの定員の20%は他の大学の2年修了生に当てられており、また大学4年修了生にも第2学年編入の機会が与えられています。高級日刊紙ルモンドには仏国全土のグランゼコールの入学者名簿が成績順に掲



大学構内を走るトラム

載されます。3年間学ぶと Diplômes d'ingénieur が取得できます。このあとは就職するか大学院に進んで Doctorat を目指すかに分れます。INPG の学生数は現在（1994/95年）2,750名、大学院生は1,375名、パーマネントの教官600名、CNRS 等の国の研究機関に籍を置く研究者600名の陣容で、教育研究予算は年間 530MF (F≒¥20) です。全体で32の研究室がありますが、一つの研究室は教官・研究者・学生あわせて100名を越す規模のものが普通です。大学院の1年目は授業と準備的研究に精を出し、小論文を印刷製本して公開審査を突破すれば、DEA 取得、その後 Thésard (テザー) として約3年間の研鑽を積んで学位取得が可能となります。1993年の統計では、Diplômes d'ingénieur: 824, DEA: 420, Doctorats: 204 ですが、社会的要請からテザーの数は急激に増加しつつあります。

INPG は国際的にも有名な原子力エネルギー研究所、Laue-Langevin 研究所、最近完成したヨーロッパ共同シンクロトロン施設とも連携しており、また以前私達家族が一年間住んだメイランの町に出現した電子・情報関連を主とした150のハイテク・アーティザナ企業群の多くと協力関係にあります。

健康的で明るいアメニティーに富む町ゲルノーブルで本学部の一人でも多くの先生方、学生諸氏が研究生生活を送れるように私も努力したいと思います。

The Great Hanshin-Awaji Earthquake Disaster



Toshihisa ADACHI

Chair professor,
Department of Civil Engineering

Introduction

Just before the dawn of January 17, 1995, a big earthquake with a magnitude of 7.2 hit the Kansai region, causing tragic loss of life, serious injuries and disastrous damage. The news immediately spread around the world. Just after the event, the staff of Kyoto University have received many sympathy letters from abroad. It is fortunate that there was little damage to the university.

At present, investigations for damage evaluation and remedial and/or restoration work are underway, done by various organizations. Many individuals in Kyoto University have provided assistance and advice in these activities.

The following outlines the damage due to this earthquake, which has been named "the 1995 Hyogoken Nanbu Earthquake", and is also referred to as "the Great Hanshin-Awaji Earthquake Disaster" by the Japanese Government.

Damage overview

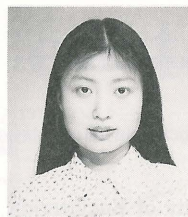
Casualties

5,502 people were killed by the earthquake, mostly in Hyogo Prefecture, but also in nearby Osaka and Kyoto Prefectures. This is the largest casualty number since the Great Kanto Earthquake Disaster in 1923. Most victims were crushed to death by the collapse of their houses, or burned to death by the fires that followed the earthquake. Half of the quake dead were over age 60. Kobe's city officials attributed the large number of deaths to the fact that many elderly people live alone in the quake-stricken areas and that a large number of houses in the area were built before and immediately after World War II. In Kobe, such old traditional wooden houses had heavy ceramic tile roofs with clay filling, having a poor resistance to earthquake force.

Houses and Infrastructure

邵 寧

応用システム科学専攻
修士課程2年



About 170,000 houses were destroyed or severely damaged in Hyogo and Osaka Prefectures. Many office and apartment buildings were also severely damaged. The number of refugees is reported to be in excess of 300,000. A large number of 7-12 floor reinforced concrete office buildings were damaged in middle or top floors. Many factories have been rendered inoperative by the earthquake, either directly by the destruction of their facilities, or indirectly by the interruption of their supply lines.

Three major railway companies operate in the narrow Hanshin area where the Rokko mountains close in on the sea, and their tracks were severely damaged. Many bridge decks and girders of railway lines moved transversely or dropped down to the ground. A large number of reinforced concrete bridge piers were also destroyed or severely damaged, deforming the railway tracks above them. Fortunately, most trains were not yet moving that morning.

Many highway bridges on the national road, Hanshin Expressway and Meishin Expressway sustained severe damage due to collapse of reinforced concrete bridge piers and/or fall-down of the superstructure. Especially in the Fukae area, a 500 m section of the route 3 of the Hanshin Expressway completely collapsed in the transverse direction onto the route 43 of the national road.

Akashi Strait Bridge is still under construction. The 1,990 m long center-span was extended by 0.8 m, due to a relative east-west displacement of 1.3 m which occurred between the two towers during the earthquake. However, no damage was observed in the bridge itself.

Geotechnical Structures

The Yodo River is the largest river in the Kansai area. A total length of 2,800 m of the left levee, and an 800 m length of the right levee, located in the southeast of Amagasaki City, were severely damaged by liquefaction.

Massive liquefaction took place on the man-made islands in Osaka Bay, especially at Port Island and Rokko Island in Kobe City. Port Island underwent a more massive liquefaction than Rokko Island. Ground settlement on the order of 50 to 100 cm could be observed on the entire island. At some locations, the quay wall laterally moved about 2 m toward the sea. Many deep ground cracks were formed parallel to the quay wall. Most of the container cranes derailed from their tracks as the result of liquefaction-induced ground motion.

The largest slope failure occurred next to Nikawa-Yurino Filtration Plant in Nishinomiya City. This landslide flowed over a 140 m by 50 m area and killed 34 persons. In Kurakuen in Nishinomiya City, rocks with a total volume of about 20 m³ came down from the hill and fell on houses and roads.

In the Daikai underground station of the Kobe Rapid Transit Railway, many reinforced concrete pillars completely collapsed, and a 95 m by 28 m area of the asphalt road above the station subsided a maximum of 3 m. Looking at this and other facts, however, it can still be said that underground structures have excellent aseismicity as compared with above-ground structures.

Concluding Remarks

There is a need to investigate the damage to various structures and examine their aseismicity; this will lead to re-evaluation of the design codes for structures. A comprehensive analysis will be required not only of destroyed or damaged structures but also of undamaged structures, taking into consideration earthquake motion, particularly the significant vertical movement peculiar to this earthquake, topography, ground condition, the shape and dimension of structures, construction materials, etc.

Finally, according to the Hyogo Prefecture Government, the cost of rebuilding areas hit by the earthquake is estimated to be some 10 trillion yen, approximately 117 billion dollars.

昨年に引き続き、今年5月に、第二回新入留学生研修旅行が行なわれました。この企画には、13ヶ国からの留学生16名と工学部国際交流関係の教職員たちの、総勢23名が参加しました。新緑が目に見える5月、私たち留学生は自然に親しみ、相互の交流を深めることができ、大変有意義な研修旅行となりました。

5月13日午前9時、私たちを乗せたバスは京都大学正門前を出発し、関西電力宮津エネルギー研究所に着きました。私たちは、美しい風景を堪能すると同時に、同研究所の発電設備の進歩に感心しました。また、同研究所の「地球に優しい」という目標には感銘を受けました。私たちも一人一人の力を合わせて、より美しい都市を作りたいと思いました。

私たちが宿泊したゼミナールハウスは大変緑が多く、静かで、自然の香りがする美しい山の中にあります。夕食後、大学のオリエンテーションが行なわれ、京都大学の研究設備や医療制度などを紹介してくれました。その後、各自自己紹介をしました。和やかな雰囲気の中で、自分の思っていることや自分の国のことについて楽しい団らんのひとときを過ごしました。

翌日、留学生生活のオリエンテーションが行なわれました。新入留学生について在留資格や留学生のアルバイトや奨学金などについて説明があり、有意義なアドバイスをいただきました。そして今年1月におこった阪神大震災の教訓を生かすべく、地震のための適切な準備を教えてくださいました。それから、私は留学生の先輩として、自分の留学体験についてお話をさせていただきました。うちとけた雰囲気の中で、私たち留学生同士、留学生と教職員が談笑しているうちに、時間が過ぎてしまいました。

旅行後、留学生向けのアンケートによると、自己紹介と宮津電力の訪問が好評だったことが分かりました。今回の研修旅行を通じてたくさんの友達ができて、そして美しい日本に良い印象が残し、楽しく有意義な旅行でした。最後に、アンケートの general impression に、皆さんはこう書いています。

Thank you very much for this interesting warm trip./ It was a nice weekend. It was joyful and I learned much./ I had a good time during the orientation. This orientation makes me to think over the life in Japan. Overall, this trip was successful.



発電設備についての説明を受ける留学生

Messages from the International Hall

Toshikazu KITAGAWA

Lecturer,
Division of Energy and Hydrocarbon Chemistry

Since the International Hall of the Faculty of Engineering was established six years ago, it has been promoting communication among the staff and the increasing number of foreign students in the Faculty. The Hall, located on the first floor in the west part of Engineering Building No. 3, is marked by its entrance, which most of you might remember because of its impressive brick construction.

The lobby of the Hall is a nice and bright place, excellent to meet people from other countries and to get together and talk with your friends. It also provides a cozy space where you can just relax on a comfortable sofa. There are some foreign and domestic magazines and newspapers, and a TV set that students can freely use. The Hall has a seminar room that is often used as a lecture room, for a Japanese language course for foreign students and for the International Course for foreign graduate research students.

The Hall staff have been continually making an effort to develop the functions of the International Hall in order to make your stay at Kyoto University more enjoyable and fruitful. Every day, one of the staff listed below stays in the office of the Hall and works on international matters, to assist the development of international exchange activity in the Faculty and the University.

One of the major services available is counseling for foreign students. We understand that the lifestyle and the culture of Japan are not always easy to get along in for those from other countries. Foreign students sometimes have personal and social problems connected with studying, life, human relationships, and so on, and need a place where they can talk about the troubles they are facing. We are prepared to talk with you individually to help you deal with those problems during your stay on campus. Please note that each staff member belongs to a department or a division of the Engineering Faculty. You might feel more familiar with some of the staff if you find them doing education and research in fields closely related to yours.

The orientation tour for newly arriving students, which was started last year, is another important event we organize. This May, many new students from abroad enjoyed an overnight trip to the northern part of Kyoto Prefecture. The impressions of one of the participants can be seen in a preceding article of this newsletter. We believe that this program offered a good opportunity for new students to get acquainted with each other and to learn

how to adjust to life in Japan.

Finally, the International Hall does not operate only for those who have come from abroad. We encourage students who are thinking of studying overseas, and will help them to make their plans successful. Students can obtain advice concerning, for instance, the required level of academic and language abilities. Also available is information on scholarships that help students stay in foreign countries, and on cooperative programs between Kyoto University and foreign universities, to give students some hints about places to start studying.

The Hall is open from 9 a.m. to 5 p.m., Monday to Friday, except on National Holidays. Counseling services are available from 1 p.m. to 2 p.m. in the office of the Hall. All students are welcome at the Hall, where you can develop new friendships with students from many countries. If you have any questions, please do not hesitate to ask one of the staff members at the Hall Office or to call 753-5013.

Staff members of the International Office:

Kenjiro SUZUKI, Professor, Mechanical Engineering

Tadanao MAEDA, Lecturer, Architecture

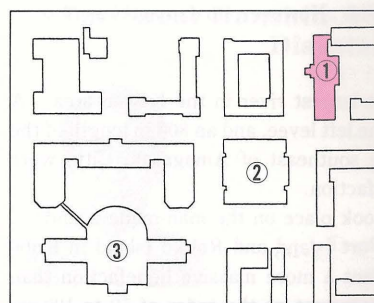
Nobuyuki YOSHIDA, Lecturer, Civil Engineering

Susumu ONAKA, Lecturer, Engineering Physics & Mechanics

Toshikazu KITAGAWA, Lecturer, Energy & Hydrocarbon chem.

Tatsuo MATSUMOTO, School Affairs Div.

Toshiko OHASHI, School Affairs Div.



- ① International Hall
(Building No. 3)
- ② Building No. 8
- ③ University Tower



国際交流日誌 (平成7年4月1日～平成7年8月31日)

平成7年

- 4月3日(月) クーエンズランド大学副学長 Dr. Edwin Thomas Brown 来訪
- 4日(火) レンズラー工科大学工学部長 Prof. Richard T. Lahey, Jr. 他1名来訪
- 26日(水) 工学部国際交流委員会
- 5月13日(土) } 新入留学生研修旅行
- 14日(日) }

5月30日(火) 工学部国際交流委員会

6月12日(月) パリ第10大学教授 Prof. Isaac JOSEPH 来訪

27日(火) 工学部国際交流委員会

7月21日(金) 工学部国際交流委員会

8月2日(水) ～9日(水)

工学部長及び関係者一行・「総合工学」学術交流事業事務打合せのため、マレーシア及びシンガポールを訪問

The Committee for International Academic Exchange, Faculty of Engineering, Kyoto University, Kyoto 606-01, Japan

Phone 075 753 5038 / Fax 075 753 5065

606-01 京都市左京区吉田本町 京都大学工学部国際交流委員会