

INTERNATIONAL CONFERENCE ON THEORETICAL PHYSICS

International Union of Pure and Applied Physics
Science Council of Japan

Programme

Excursions

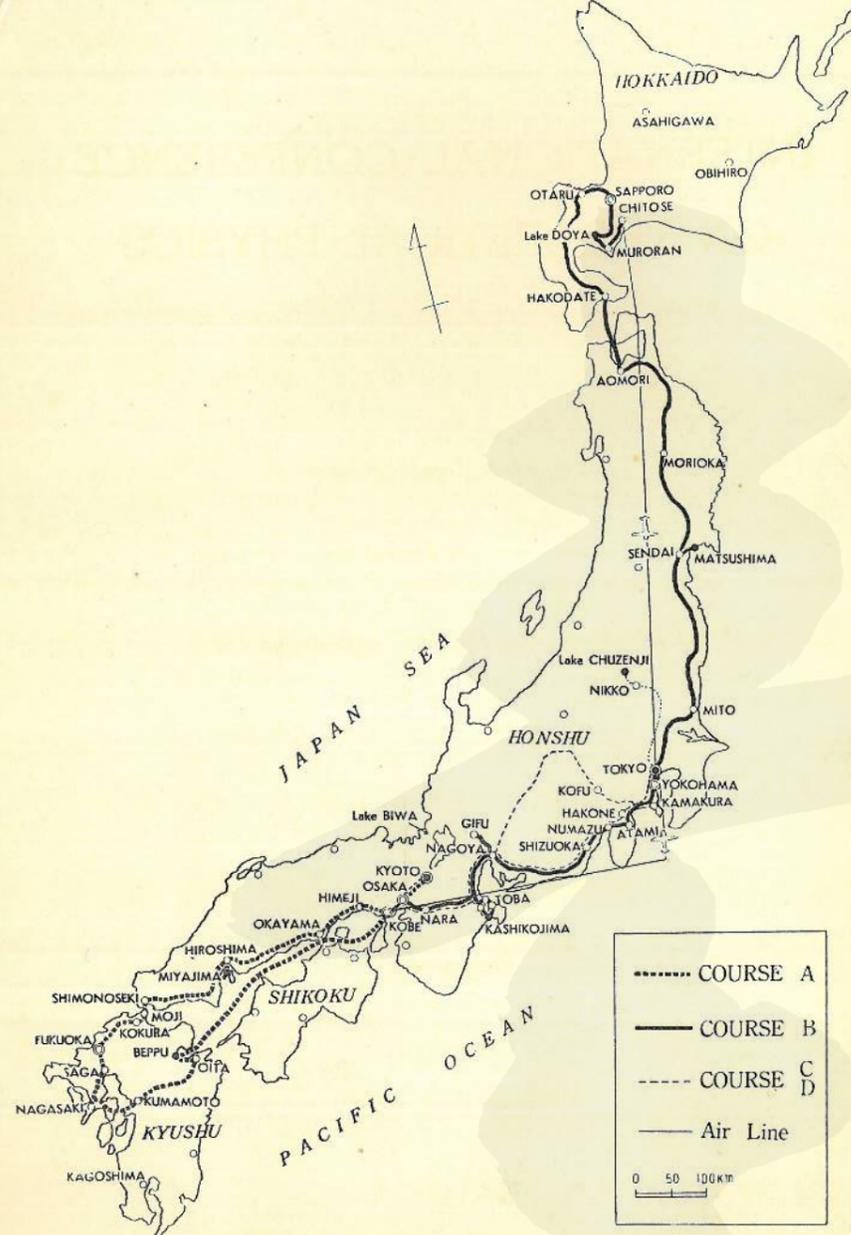
Institutions in Japan

Kyoto and Tokyo, September 1953

c071-011

BOX 27





Excursions after the Conference
See page 19

INTERNATIONAL CONFERENCE ON THEORETICAL PHYSICS

Organized by
The Science Council of Japan
with the collaboration of
Kyoto University and The Physical Society of Japan
under the auspices of
The International Union of Pure and Applied Physics
supported by
U. N. E. S. C. O. and The Rockefeller Foundation

Programme
Excursions
Institutions in Japan

Kyoto and Tokyo, September 1953

INTERNATIONAL CONFERENCE
ON THEORETICAL PHYSICS

CONTENTS

I. Conference Staff	1
II. Conference Schedule	2
III. Programme	6
III a. Key Table	6
III b. Detailed Programme	8
III c. Symposia	15
IV. Excursions	20
V. Institutions in Japan	30

INTERNATIONAL CONFERENCE ON THEORETICAL PHYSICS

I. CONFERENCE STAFF

PRESIDENT OF THE SCIENCE COUNCIL OF JAPAN

Kameyama, Naoto

OFFICERS OF THE CONFERENCE :

PRESIDENT	<i>Yukawa, Hideki</i>
SECRETARY	<i>Fujioka, Yoshio</i>
CHAIRMAN OF THE NATIONAL COMMITTEE FOR I.U.P.A.P.	<i>Kotani, Masao</i>
CHAIRMAN OF THE SPECIAL COMMITTEE FOR ATOMIC NUCLEI, SCIENCE COUNCIL OF JAPAN	<i>Tomonaga, Sin-itiro</i>
PRESIDENT OF KYOTO UNIVERSITY	<i>Hattori, Shunjiro</i>
PRESIDENT OF THE PHYSICAL SOCIETY OF JAPAN	<i>Yamanouchi, Takahiko</i>

ORGANIZING COMMITTEE :

<i>Fujioka, Yoshio</i>	<i>Hasegawa, Mankichi</i>	<i>Hirata, Morizo</i>
<i>Husimi, Koki</i>	<i>Imai, Isao</i>	<i>Kaya, Seiji</i>
<i>Kikuchi, Seishi</i>	<i>Kobayashi, Minoru</i>	<i>Kotani, Masao</i>
<i>Mimura, Yosataka</i>	<i>Muto, Toshimosuke</i>	<i>Sakata, Shoichi</i>
<i>Sato, Koji</i>	<i>Tani, Yasumasa</i>	<i>Tomonaga, Sin-itiro</i>
<i>Tomotika, Susumu</i>	<i>Yamanouchi, Takahiko</i>	<i>Yukawa, Hideki</i>

II. CONFERENCE SCHEDULE

Sept. 11th (Fri.) — 13th (Sun.) TOKYO and NIKKO

For participants of Symposium on Cosmic Rays.

11th (Fri.) Tokyo
Morn. & Aft. *Symposium on Cosmic Rays.*
12th (Sat.) Regular Nikko Excursion.
& Participants joining the Excursion will leave Tokyo
13th (Sun.) on the morning of the 12th.
(See under "Regular Nikko Excursion" for details)

For participants of Symposium on Molecular Physics.

11th (Fri.)
Morning Leave Tokyo in the morning, arriving at Nikko
(Kanaya Hotel), in time for lunch.
Aft. & Even. *Symposium on Molecular Physics* (1st session)
12th (Sat.)
Morning *Symposium on Molecular Physics* (2nd session)
Afternoon Join the Regular Nikko Excursion.
(See under "Regular Nikko Excursion" for details)
13th (Sun.)
Morn. & Aft. Regular Nikko Excursion.

For participants of Symposium on Crystal Dislocation.

11th (Fri.)
Morning Pre-Symposium Nikko Excursion.
Those joining this excursion will leave Tokyo for
Nikko on the morning of the 11th, arriving at
Nikko (Kanaya Hotel) in time for lunch.

2

Afternoon Sightseeing at Nikko (Lake Chuzenji).
Dinner and accommodation at Lakeside Hotel.

12th (Sat.)
Morning Sightseeing at Nikko (Lake Chuzenji)
Aft. & Even. *Symposium on Crystal Dislocation* (1st session).
13th (Sun.)
Morning *Symposium on Crystal Dislocation* (2nd session).
Afternoon Sightseeing (Toshogu)
Join the Regular Nikko Excursion and return to Tokyo.

"Regular Nikko Excursion."

12th (Sat.)
Morning Leave Tokyo for Nikko in the morning, arriving at
Kanaya Hotel in time for lunch.
Afternoon Sightseeing (Toshogu).
Dinner and accommodation at Kanaya Hotel.
13th (Sun.)
Morn. & Sightseeing (Lake Chuzenji). Lunch at Lakeside Hotel.
Afternoon Return to Tokyo.
Banquet by the Federation of Economic Organizations
and the Japan Chamber of Commerce and Industry.

(Map will be found on page 29)

3

Sept. 14th (Mon.) — 24th (Thu.) TOKYO and KYOTO

- 14th (Mon.) TOKYO
Morning & Afternoon Sightseeing tour in Tokyo by motor-coach. Invitation to *Noh*-Play by the Organizing Committee.
Afternoon Invitation to cocktail party by the Foreign Minister and the Minister of Education.
Late aftern. Invitation to *Kabuki*, classical Japanese theatre, by the Physical Society of Japan.
Accommodation at Imperial Hotel, Hotel Tokyo, Hotel Teito etc.
- 15th (Tue.) TOKYO
10.00-11.30 **Opening Session** at the University of Tokyo, followed by lunch at the University.
Afternoon Visit to universities and research institutes in Tokyo.
Evening Welcome reception dinner by the Presidents of the Science Council of Japan and the Japan Academy.
- 16th (Wed.) TOKYO - HAKONE - ATAMI
9.15 Leave hotel on journey to Kyoto through Fuji-Hakone National Park.
13.00 Arrive Hakone. Lunch at Hakone Hotel, on the shore of Lake Ashinoko.
15.00 Leave Hakone by motor-coach for Atami via Ten Province Pass.
17.00 Arrive Atami, a hot spring resort.
Dinner and accommodation at Atami Hotel and Atami Kanko Hotel.
- 17th (Thu.) ATAMI - KYOTO (See the map on page 26)
Day journey to Kyoto by train.
Dinner and accommodation during the period of the main sessions at Miyako Hotel.

- 18th (Fri.) KYOTO
Morn. & Aft. **Main Sessions** (full day).
Evening Welcome reception by the President of Kyoto University.
- 19th (Sat.) KYOTO
Morning **Main Sessions** (half day).
Afternoon Sightseeing by motor-coach in and around Kyoto.
Evening "Physicists Only" Beer Party in two groups
(1. Field theory;
2. Statistical mechanics and solid state physics)
- 20th (Sun.) KYOTO
Morn. & Aft. **Excursion to Nara**, ancient city of temples and shrines, including Horyuji, the world's oldest wooden edifice. Alternative excursion to the suburbs of Kyoto for those who will visit Nara on Post-Conference Excursions.
- 21st (Mon.) KYOTO
Morn. & Aft. **Main Sessions** (full day).
Evening Symposium on "Magnetic After-Effects."
- 22nd (Tue.) KYOTO
Morning **Main Sessions**
Afternoon Main Session. Section C only.
Late Aft. Garden party sponsored by the Prefectural and Municipal Governments and the Kyoto Chamber of Commerce and Industry.
- 23rd (Wed.) KYOTO
Morn. & Aft. **Main Sessions** (Sections A & C, full day).
- 24th (Thu.) KYOTO - OSAKA
Conference participants have a choice of joining
(1) one of the small discussion groups in Kyoto,
(2) one of the two symposia at the Osaka University on
(a) Nuclear Magnetic Resonance Absorption,
(b) Theory of Liquid Helium,
(3) a sightseeing excursion in and around Osaka.
- 25th (Fri.) EXCURSIONS A, B, C & D begin on this day.
(See the section IV, page 19)

III. PROGRAMME

III. a. KEY TABLE

Pre-Conference Symposia (TOKYO and NIKKO)

	Regular NIKKO Excursion	Symposia		
		Cosmic Rays TOKYO	Molecular Phys. NIKKO	Crystal Disl. NIKKO
11th (Fri.) Morning		Symposium	Leave Tokyo for Nikko	
Afternoon		Symposium	Symposium	Sightseeing
12th (Sat.) Morning	Leave Tokyo for Nikko		Symposium	Sightseeing
Afternoon	Sightseeing (Toshogu)			Symposium
13th (Sun.) Morning	Sightseeing (Lake Chuzenji)			Symposium
Afternoon	Return to Tokyo			Sightseeing
16th (Wed.) Evening	Symposium on Polymers (SHIZUOKA)			

Main Conference (KYOTO)

Section	A	B	C
18th (Fri.) Morning	Field Theory A	Crystal Dislocation	Molecules
Afternoon	Field Theory B	Polymers	Metals

Section	A	B	C
19th (Sat.) Morning	Cosmic Rays & V-particles	Liquids	Intrinsic Magnetization
Afternoon	Sightseeing in and around Kyoto		
Evening	Beer Party	Beer Party	
20th (Sun.) Morn. & Aft.	Excursions to Nara and suburbs of Kyoto		
21st (Mon.) Morning	Pions	Transport Phenomena	Antiferro- & Ferrimagnetism
Afternoon	Strong and Intermediate Coupling Meson Theories	Irreversible Processes	Magnetic Resonance Absorption & Relaxation.
22nd (Tue.) Morning	Nuclear Forces	General Method in Statistical Mechanics	Dielectrics
Afternoon			Colour Centres
4-30 p.m.	Garden Party		
23rd (Wed.) Morning	Nuclear Reactions		Liquid Helium
Afternoon	Beta-decay & Shell Structure		Superconductivity

Symposia during and after the Main Conference

- 21st Evening (KYOTO):** Magnetic Fluctuation After-Effect
23rd Evening (KYOTO): Polymers
24th Morning (KYOTO): Field Theory
24th Morning (OSAKA): Nuclear Magnetic Resonance
24th Afternoon (OSAKA): Liquid Helium

III. b. DETAILED PROGRAMME OF MAIN SESSIONS

Section A

18th (Fri.) Morn. & Aft.: **Field Theory A. Non-Local Theory**

Chairman Prof. *J. R. Oppenheimer*, Co-chairmen Profs. *S. Sakata* and *H. Enatsu*

- (1) *H. Yukawa*: Non-Local Field Theory
- (2) *C. Møller*: On Field Theories with Non-Local Interactions
- (3) *R. Peierls*: On the Non-Local Interaction
- (4) *H. Yukawa*: Reviews of Work on Non-Local Theories in Japan
- (5) Discussion and Comments

18th (Fri.) Afternoon: **Field Theory B. Miscellaneous Problems**

Chairman Prof. *R. P. Feynman*, Co-chairman Profs. *R. Utiyama* and *S. Hayakawa*

- (1) *K. Nishijima*: Many-Body Problem in Quantum Field Theory
- (1a) *H. Suura*: Many-Body Problem in Quantum Field Theory
- (2) *W. Heitler*: Exact Theory of Line Breadth

19th (Sat.) Morning: **Cosmic Rays and V Particles**

Chairman Prof. *H. J. Bhabha*, Co-chairmen Profs. *M. Taketani* and *K. Nishijima*

- (1) *R. E. Marshak*: Cosmotron Experiments on Mesons
- (2) *H. J. Bhabha*: On the Multiple Meson Production
- (3) *W. Heitler*: Interpretation of Cosmic Ray Jets
- (4) *A. Pais*: On the Barytron-Meson-Photon System
- (5) *H. Fukuda*: Models for V Particles
- (6) Comments and Discussions on New Particles
A. Pais, R. Peierls, S. Hayakawa, etc.

8

21st (Mon.) Morning: **Pions**

Chairman Prof. *G. Wentzel*, Co-chairman Prof. *S. Tomonaga*

- (1) *G. Wentzel*: Experimental Work on Pion-Nucleon Scattering at Chicago
- (1a) *C. N. Yang*:
- (1b) *K. Aizu*: Notes on the Phase Shifts of Pion-Nucleon Scattering
- (2) *R. E. Marshak*: Phenomenological Theory of Pion-Nucleon Interactions
- (2a) *K. A. Brueckner*:
- (3) *N. Fukuda*: Theoretical Analysis of Pion-Nucleon Scattering
- (3a) *K. Sawada*: Electromagnetic Phenomena of Pion-Nucleon System

21st (Mon.) Afternoon: **Strong and Intermediate Coupling Meson Theories.**

Chairman Prof. *R. E. Peierls*, Co-chairman Prof. *S. Hayakawa*

- (1) *G. Wentzel*: Recoil Effect in Strong Coupling Theory
- (2) *S. Tomonaga*: Fundamental Formalism of Intermediate Coupling Theory
- (2a) *K. Sawada*: An Approximation Method for Pion-Nucleon Scattering
- (2b) *T. Ito*: Application of Intermediate Coupling Theory to Pion-Nucleon Scattering
- (3) *L. I. Schiff*: Lattice-Space Quantization of a Nonlinear Field Theory
- (4) Discussions on the theory of mesons

22nd (Tue.) Morning: **Nuclear Forces**

Chairman Prof. *A. Proca*, Co-chairman Prof. *T. Toyoda*

- (1) *R. E. Marshak*: Recent Work in the United States
- (2) *G. Breit*: General Views
- (3) *M. Taketani*: Studies on Nuclear Force in Japan
- (3a) *M. Lévy*
- (3b) *M. Sugawara*
- (3c) *I. Sato*
- (3d) *N. Fukuda*
- (3e) *S. Otsuki*
- (3f) *H. Hasegawa*
- (3g) *S. Machida*

9

23rd (Wed.) Morning: Nuclear Reactions

Chairman Prof. *E. P. Wigner*, Co-chairman Prof. *H. Fukuda*

- (1) *R. Serber*: Reports on Recent Experiments in the United States
- (2) *J. A. Wheeler*: Collective Model of Nucleus and the Interpretation of Fission Phenomena
- (3) *S. Hayakawa*: Formal Theory of Nuclear Reactions
 - (3a) *Y. Fujimoto*: Deuteron Reactions
 - (3b) *L. I. Schiff*: Interpretation of Electron Scattering Experiments
 - (3c) *P. Huber*: Measurement of the Polarization of d-d Neutrons: Comparison with the Theoretical Results based on the Konopinski-Teller Model of d-d Reaction
- (4) Discussion

23rd (Wed.) Afternoon: Beta-Decay and Shell Structure

Chairman Prof. *C. Möller*, Co-chairmen Profs. *H. Yukawa* and *H. Enatsu*

- (1) *M. G. Mayer*: Shell Structure of the Nucleus
 - (1a) *M. Umezawa*: On Nuclear Moments
- (2) *S. Nakamura*: Study on Shell Structure and Beta-Decay in Japan
- (3) *E. P. Wigner*: Note on Beta-Decay
- (4) *Y. Tanikawa*: On the Interaction Form of Beta-Decay
- (5) Discussion and Comments

Section B

18th (Fri.) Morning: Crystal Dislocation

Chairman Dr. *F. C. Frank*, Co-chairman Prof. *Y. Tani*

- N. F. Mott*: Difficulties in the Theory of Dislocations
T. Suzuki and *H. Suzuki*: Dislocation Networks in Crystals
R. Hasiguti: Internal Friction of Metals due to Crystal Imperfections
F. Seitz: Theory of Kirkendall Effect.

10

18th (Fri.) Afternoon: Polymers

Chairman Prof. *I. Prigogine*, Co-chairman Prof. *S. Oka*

- P. J. Flory*: The Configuration and Properties of Polymer Molecules in Dilute Solutions
J. G. Kirkwood: The Theory of Visco-Elastic Properties of High Polymers
A. Ishihara: Statistical Mechanics of Rubber Elasticity
E. Teramoto: Statistical Mechanics of Chain Polymers

19th (Sat.) Morning: Liquids

Chairman Prof. *P. J. Flory*, Co-chairman Prof. *A. Harasima*

- J. E. Mayer*: Theory of Liquids
J. G. Kirkwood: Statistical Mechanical Theory of the Liquid State
A. Harasima: Statistical Mechanics of Surface Tension

21st (Mon.) Morning: Transport Phenomena

Chairman Prof. *J. G. Kirkwood*, Co-chairman Prof. *T. Kihara*

- J. de Boer*: Quantum Theory of Transport Processes
S. Ono: Quantum-Statistical Theory of Transport Phenomena
T. Yamamoto: Statistical Mechanics of Irreversible Phenomena

21st (Mon.) Afternoon: Irreversible Processes

Chairman Prof. *J. de Boer*, Co-chairman Prof. *S. Ono*

- I. Prigogine*: Some Recent Applications of Thermodynamics to Irreversible Processes
H. Takahasi: Statistical and Formal Theories of Thermal Fluctuations
N. Hashitsume: Thermal Fluctuations in Linear Dissipative Systems

22nd (Tue.) Morning: General Methods in Statistical Mechanics

Chairman Prof. *J. E. Mayer*, Co-chairman Prof. *K. Husimi*

- J. de Boer*: Theoretical Treatment of the Quantum Properties of Condensed Systems
K. Husimi: Statistical Mechanics of Condensation

Prepared Discussions

- S. Katsura*: On the Theory of Cooperative Phenomena
K. Ikeda: On the Theory of Condensation
M. N. and *A. W. Rosenbluth*: Equation of State Calculations

11

Section C

18th (Fri.) Morning: **Molecules**

Chairman Prof. C. A. Coulson, Co-chairman Prof. M. Kotani

- M. Kotani: Methods of Approximation in the Theory of Electronic Structure of Molecules (Introductory Talk)
P. O. Löwdin: Recent Simplifications in the Molecular Orbital Theory of Calculating Energy Levels
J. C. Slater: Work on Molecular Theory in the Solid State and Molecular Theory Group, M.I.T.
R. Mulliken: Intermolecular Charge-Transfer Forces

18th (Fri.) Afternoon: **Metals**

Chairman Prof. J. C. Slater, Co-chairman Prof. T. Muto

- C. A. Coulson: A New Approach to the Electronic Theory of Solids.
J. H. Van Vleck: Cohesive Energy of Alkali Metals
E. Wigner: Qualitative Theory of Cohesion in Metals
L. Onsager: Diamagnetism of Metals

Prepared Discussions

- A. Morita: Band Structure of Semi-Metals
R. Peierls: On Diamagnetism of Metals

19th (Sat.) Morning: **Electron Theory of Intrinsic Magnetization**

Chairman Prof. L. Néel, Co-chairman Prof. T. Nagamiya

- J. C. Slater: Configuration Interaction and Ferromagnetism
T. Matsubara and T. Yokota: Band Theory of Antiferromagnetism

21st (Mon.) Morning: **Antiferro- and Ferrimagnetism**

Chairman Prof. C. J. Gorter, Co-chairman Prof. R. Kubo

- L. Néel: Ferrimagnetism
T. Nagamiya: Antiferromagnetism of $\text{CuCl}_2 \cdot 2\text{H}_2\text{O}$

12

- K. Yosida: Problems of Anisotropy Energy of Antiferromagnetics and of Ferrites
T. Okamura: Resonance Absorption in Ferrites

Prepared Discussions

- K. Yosida: The origin of the Anisotropy Energy of $\text{CuCl}_2 \cdot 2\text{H}_2\text{O}$
T. Nagata: On the Ferrimagnetism of Rocks
H. Watanabe: The Temperature Dependency of Susceptibilities of Ferrites on the Basis of the Theory of Ferrimagnetism

21st (Mon.) Afternoon: **Magnetic Resonance Absorption and Relaxation**

Chairman Prof. J. H. Van Vleck, Co-chairman Prof. T. Muto

- N. Bloembergen: Magnetic Relaxation in Solids
R. Kubo and K. Tomita: Broadening in Nuclear Magnetic Resonance Absorption
H. Kumagai: Resonance Absorption Experiments of Paramagnetic Salts

Prepared Discussions

- T. Muto and M. Watanabe: On the Spin-Lattice Relaxation in the Nuclear Magnetic Absorption in Solids
K. Tomita and S. Koide: Dependence of Paramagnetic Resonance on Frequency and the Crystalline Anisotropy

Further problems will be discussed at a symposium. See page 18.

22nd (Tue.) Morning: **Dielectrics**

Chairman Prof. F. Seitz, Co-chairman Prof. S. Miyake

- H. Fröhlich: Electrons in Dielectrics
J. Yamashita: Quantum Theory of Dielectrics
K. S. Krishnan: Polarization Field in Ionic Crystals
Y. Takagi: Ferro- and Antiferroelectricity

Prepared Discussions

- H. Kawamura: On the Electric Conduction of Dielectrics under Strong Electric Field

13

22nd (Tue.) Afternoon : **Colour Centres**

Chairman Prof. *H. Fröhlich*, Co-chairman Prof. *R. Kubo*

F. Seitz : Theory of Colour Centres in Alkali Halides.

Y. Uchida and *M. Ueta* : Recent Experiments on Colour Centres of Alkali Halides

T. Inui, *Y. Uemura* and *Y. Toyozawa* : Theory of the Electronic Structure of Colour Centres

Prepared Discussions

T. Nagamiya, *T. Kojima*, *Z. Kanamori* and *T. Moriya* : Application of the Wigner-Seitz Method to the F-Centre

23rd (Wed.) Morning : **Liquid Helium**

Chairman Prof. *L. Onsager*, Co-chairman Prof. *M. Toda*

L. Onsager : Introductory Talk

C. J. Gorter : Some Recent Data on Liquid Helium II

S. Nakajima : Review of the Recent Work in Japan on the Two Fluid Theory of Liquid Helium

R. P. Feynman : Atomic Theory of Liquid Helium

Prepared Discussions

T. Nishiyama : On the Theory of Sound Waves Applied to Energy Spectra of Helium II

K. Kamiya : A Quantum Theory of Boson Assembly

K. Husimi : Uncertainty Relations and Ground States

Further problems will be discussed at a symposium. See page 19.

23rd (Wed.) Afternoon : **Superconductivity**

Chairman Prof. *N. F. Mott*, Co-chairman Prof. *K. Ariyama*

H. Fröhlich : Remarks on the Theory of Superconductivity

Y. Kitano : On the Phase Transition of the Electron-Lattice Vibration Systems

M. Toda : On the Theory of Superconductivity

Prepared Discussions

H. Ichimura : Statistical Mechanics of Electron-Lattice System

Y. Kitano, *H. Nakano*, *S. Nakajima* and *S. Hayakawa* : Remarks on Fröhlich's Theory of Superconductivity

III c. SYMPOSIA

A. SYMPOSIUM ON COSMIC RAYS

(Yamaha Hall, TOKYO, Sept. 11)

Morning Session. Time Variation of Cosmic Ray Intensity.

9.00 a.m.

(1) *M. S. Vallarta* : On the Albedo Effect of Cosmic Rays 30 min
Comment by *M. Wada* and *Maeda* : Atmospheric Temperature Effects 25 min

Discussions

(2) *Y. Sekido* : On the Cosmic Ray Storms 25 min
Discussions 25 min

Intermission 15 min

(3) *J. A. Wheeler* : On the Origin of Cosmic Rays 30 min
Comment by *S. Yoshida* : Observation of Anisotropy
Comment by *S. Hayakawa* : Propagation through Interstellar Space

Discussions 30 min

Lunch 1 hr

Afternoon Session. High Energy Phenomena.

1.00 p.m.

(4) *E. Amaldi* : Underground Experiments in Europe 30 min
Comment by *T. Oshio* : Underground Experiments at Yaizu 20 min

Discussions 15 min

(5) *K. Kamata* and *J. Nishimura* : Theory of Air Showers . 30 min
Comment by *G. Fujioka* : Observation of Lateral Distribution 20 min

Discussions 15 min

(6) *O. Minakawa*, *I. Miura* and *S. Miyake* : Observation of Penetrating Showers 20 min

Discussions 15 min

B. SYMPOSIUM ON MOLECULAR PHYSICS

(Kanaya Hotel, NIKKO, Sept. 11 and 12)

Sept. 11 (Fri.) Afternoon.

14.00-15.40 ELECTRONIC STRUCTURE OF SIMPLE MOLECULES

J. C. Slater: Report of Work in M.I.T.

E. Ishiguro: Results of Calculation of Electronic Structure of Some Simple Molecules

Discussions:

K. Niira: σ - π Interaction in Benzene

K. Tomita and *Y. Fukui*: Electronic Structure of Lithium Hydride

14.00-16.00 π ELECTRON SYSTEMS

C. A. Coulson: Introductory Lecture

G. Araki: Review of Work in Japan

20.00-21.40 INTERMOLECULAR INTERACTION

R. S. Mulliken: Interactions between Donors and Acceptors

I. Osida: Interaction between Long Conjugated Double-Bond Systems

Sept. 12 (Sat.) Morning.

9.00-10.20 MOLECULAR COLLISIONS

K. Takayanagi: Molecular Collision and Properties of Hydrogen Gas at Low Temperatures

J. de Boer: Pressure-Induced Absorption

10.30-12.20 MICROWAVE STUDY OF MOLECULES

C. H. Townes: Recent Contributions of Microwave Spectroscopy to Knowledge of Molecular Structure

K. Shimoda: Microwave Study of the Methylamine Molecule

S. Kojima: Pure Quadrupole Transition Spectra

C. SYMPOSIUM ON CRYSTAL PLASTICITY AND DISLOCATION

(Kanaya Hotel, NIKKO, Sept. 12 and 13)

Sept. 12 (Sat.) 14.00-15.30 Prof. *Y. Tani* presiding.

(1) *F. C. Frank*: Visual Evidence of Dislocations

(2) *K. Kinoshita* and *J. Nakayama*: Spiral Cleavage of Mica

16

15.45-17.30 Prof. *T. Suzuki* presiding.

(3) *Y. Tani*: Microelasticity

(4) *E. Fukushima* and *S. Ookawa*: On the Behaviour of Grain Boundary Observed in Soap Bubble Raft

19.30-21.30 Prof. *R. R. Hasiguti* presiding.

(5) *J. Takamura*: Effect of Anodic Surface Film on the Plastic Deformation of Aluminium Crystals

Sept. 13 (Sun.) 9.30-11.30 Prof. *A. Ookawa* presiding.

(6) *N. F. Mott*: Dislocation Fracture

(7) *H. Kanzaki*: Investigation of Plasticity of Ionic Crystals

(8) *K. Ishii*: Mechanical Twinning of Single Crystals of Tin

D. SYMPOSIUM ON THE VISCOSITY AND THE VISCO-ELASTICITY OF HIGH POLYMERS

(SHIZUOKA, Sept. 16, 7.45-9.15 p.m.)

1. *N. Saito*: On the Irreversible Process in the Solution of Macromolecules (10 min.)

2. *J. G. Kirkwood*: Visco-Elastic Behavior of Macromolecules in Solution (20 min.)

3. *A. Miyake*: Visco-Elasticity of High Polymeric Substances (10 min.)

4. *P. J. Flory*: Intrinsic Viscosity in Ideal Systems (20 min.)
9.15-10.00 Free Discussion

E. SYMPOSIUM ON MAGNETIC AFTER-EFFECT

(KYOTO, Sept. 21, 7.30-10.00 p.m.)

1. *L. Néel*: Magnetic Fluctuation After-Effect

N. Kawai: Discussion to the above theme

2. *T. Taoka*: Magnetic After-Effect of Nickel-Manganese Alloys

T. Nagashima: Discussion to the above theme

3. *Y. Tomono*: Magnetic After-Effect of Low Carbon Steels

4. *S. Maeda*: Magnetic After-Effect due to the Irreversible Displacement of Domain Boundaries

17

**F. SYMPOSIUM ON CHARGED HIGH POLYMERS AND
HIGH POLYMER SOLUTIONS**

(KYOTO, Sept. 23, 7.45-9.15 p.m.)

1. *H. Oosawa*: Theory of Polyelectrolyte Solutions and Mechano-Chemical Systems (10 min.)
2. *H. Shogenji*: On the Light Scattering in Polyelectrolyte Solutions (10 min.)
3. *P. J. Flory*: Donnan Equilibria and Molecular Configuration (20 min.)
4. *J. G. Kirkwood*: The Fractionation of Proteins by Electrophoresis-Convection (20 min.)
5. *I. Prigogine*: Theory of R-mer Liquids and Solutions (20 min.)
9.15-10.00 Free Discussion

G. SYMPOSIUM ON FIELD THEORY

(KYOTO, Sept. 24, Morning)

Prof. *F. Bopp's* Lecture on "Recent Work in Germany" will be delivered.

H. SYMPOSIUM ON NUCLEAR RESONANCE ABSORPTION

(Osaka University, OSAKA, Sept. 24, 9.00-12.30 a.m.)

1. *N. Bloembergen*: Nuclear Resonance in Solid Hydrogen
2. *H. Kanda*: Experiment on Nuclear Resonance in Solid Hydrogen
3. *K. Tomita*: Interpretation on Nuclear Resonance Absorption in Solid Hydrogen
4. *E. M. Purcell*:
5. *J. Itoh*: Proton Resonance Experiment on the Single Crystal of NH_4Cl
6. *S. Kanda*: Chemical Shift in Concentrated Acids

I. SYMPOSIUM ON LIQUID HELIUM

(Osaka University, OSAKA, Sept. 24, 2 p.m.)

Prof. *K. Husimi* presiding

1. *I. Prigogine*: Molecular Theory of Liquid Helium
2. *S. Ueda*: Cohesive Energy of Liquid Helium
3. *R. Nozawa*: Cohesive Energy of Helium at Temperature 0°K .
4. *T. Matsubara*: Atomic Theory of Liquid Helium
5. *M. Toda*: On the Viscosity of Liquid He^3
6. *J. Mikura*: Second Sound in the Mixture of He^3 and He^4
7. *R. Kubo*:



IV. EXCURSIONS

Pre-Conference Excursion to NIKKO

On 12 and 13 September, an excursion is arranged for visiting Nikko, situated in one of our national parks and famous for its natural and architectural beauty. In the afternoon of the first day, participants will visit the Toshogu Shrine, built in 1616 and dedicated to the founders of the Tokugawa Shogunate. The next morning will be spent in a tour of Lake Chuzenji and the Kegon Water-fall, after which the visitors will return to Tokyo, arriving in the capital late in the evening, 13 September.

At Nikko it is appreciably cooler than in Tokyo.

Rough estimate of expenses (all-inclusive): ¥5,000.

Excursion A

(HIROSHIMA, KYUSHU and INLAND SEA)

The excursion begins with departure from Osaka at 9.10 on 25 Sept. and terminates with arrival at Haneda Airport at 16.30 on 3 Oct.

Rough estimate of expenses (all-inclusive): ¥50,000.

This course is recommended to those who wish to enjoy a trip both through the volcanic landscape of the Unzen and Aso National Parks and through the lovely scenery of the Inland Sea, our only national park situated on the water. This Sea has been likened to the Aegean Sea, and with its innumerable picturesque islets and its intricately contoured shores, it will not fail to charm the visitor into the dream-land of the fascinating colour-prints of Hiroshige.

The best parts of the Inland Sea will be traversed during the return overnight passage from Kyushu to Osaka through its calm waters.

Kyushu abounds in volcanoes, among which the most famous is Mt. Aso for its typical caldera crater, with the largest diameter in the world, and its active central cone of model form.

Hiroshima and Nagasaki, the two cities once damaged by the Atom Bomb, both lie on the course of this excursion.

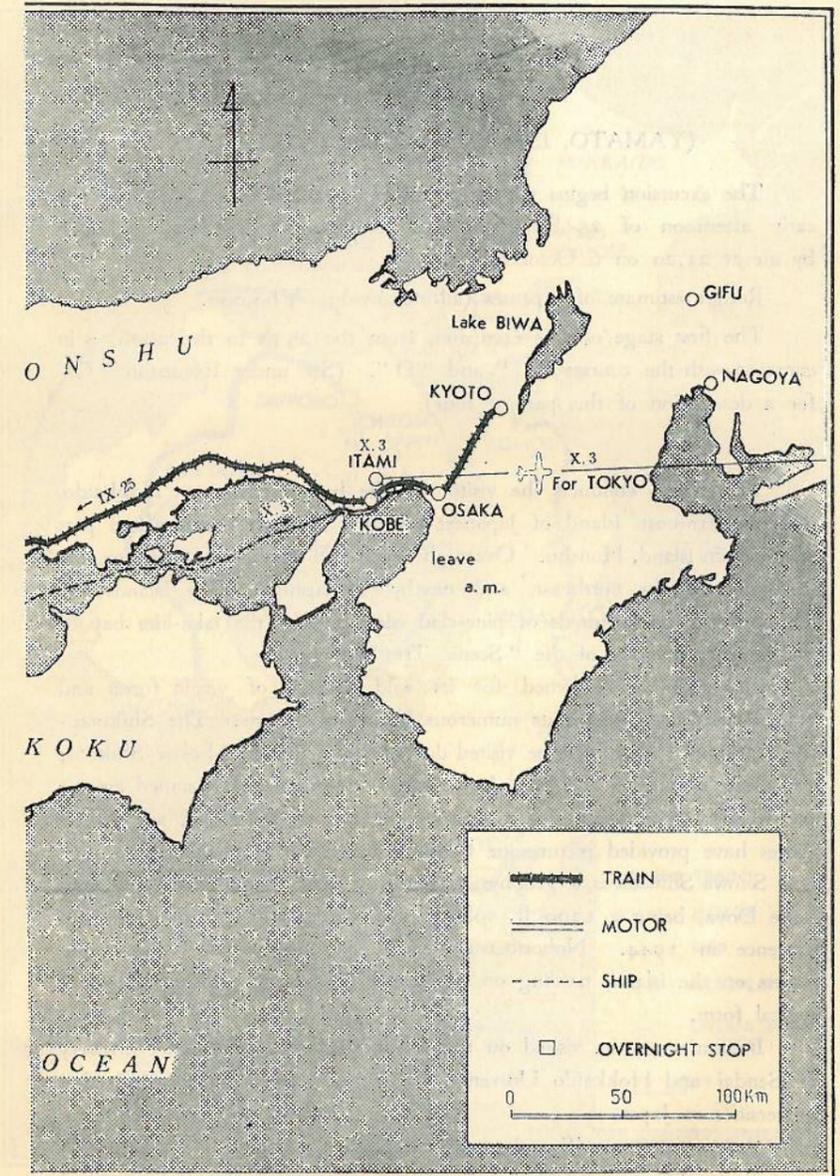
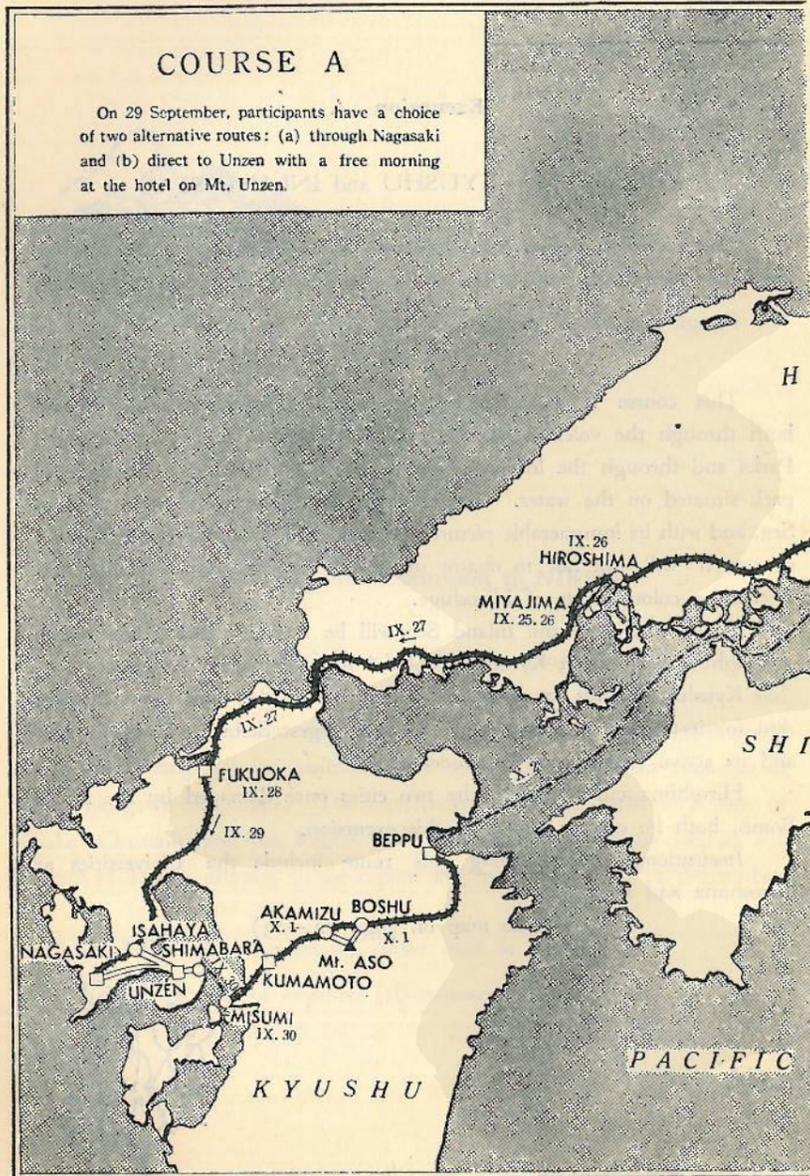
Institutions situated along this route include the Universities at Hiroshima and Fukuoka.

(See the map on page 22—23)



COURSE A

On 29 September, participants have a choice of two alternative routes: (a) through Nagasaki and (b) direct to Unzen with a free morning at the hotel on Mt. Unzen.



Excursion B

(YAMATO, ISE, SENDAI, and HOKKAIDO)

The excursion begins with departure from Osaka for Nara in the early afternoon of 25 September, and terminates with arrival in Tokyo by air at 21.20 on 6 October.

Rough estimate of expenses (all-inclusive): ¥60,000.

The first stage of this excursion, from the 25 th to the 28 th, is in common with the courses "C" and "D". (See under Excursion "C" for a description of this part of tour).

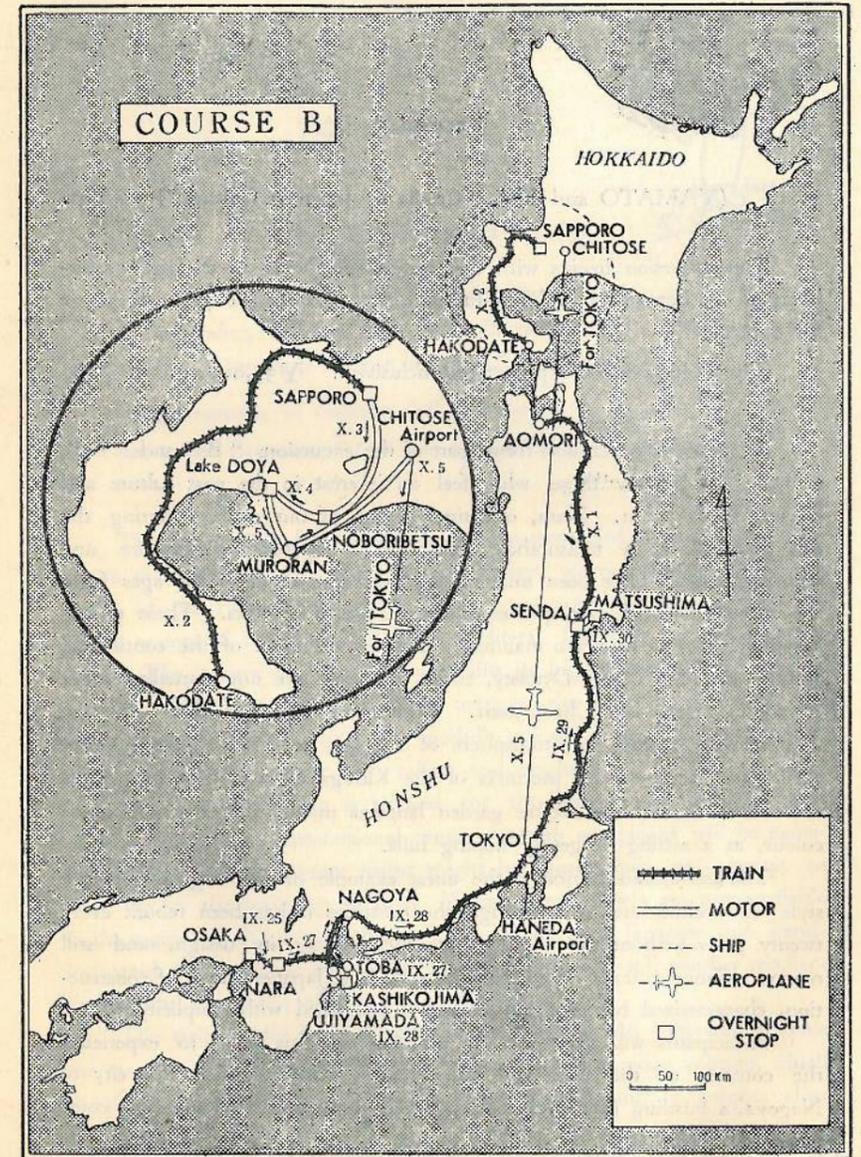
This course conducts the visitor off the beaten paths to Hokkaido, the northernmost island of Japanese territory, through the northern part of the main island, Honshu. Overnight stops will be made at Sendai, the metropolis of the northeast, and nearby Matsushima (Pine Islands), so named from the hundreds of pine-clad islets dotting the lake-like bay of the same name, one of the "Scenic Trio" of Japan.

Hokkaido is renowned for its wild scenery of virgin forest and hidden lakes, and also for its numerous hot-spring resorts. The Shikotsu-Doya National Park will be visited during the excursion. Lakes Shikotsu and Doya are among the most beautiful in Hokkaido, embosomed among well-wooded mountains and surrounded by fuming volcanoes, while their shores have provided picturesque locations for hot-spring resorts.

Showa Shinzan is a geophysical curiosity which may be viewed from Lake Doya, being a 1300 ft. volcano which suddenly raised itself into existence in 1944. Noboribetsu Spa is one of the largest hot-spring resorts on the island, nestling on the breast of a large extinct volcano of typical form.

Institutions to be visited on this excursion include Tohoku University at Sendai and Hokkaido University at Sapporo, two among the oldest universities in Japan.

(See the map on page 25)





Excursion C

(YAMATO and ISE, "Cradle of Japanese Culture")

This excursion begins with departure from Osaka in the early afternoon of 25 September and terminates with arrival in Tokyo at 20.30 on 30 September.

Rough estimate of expenses (all-inclusive): ¥30,000.

This course, which also forms part of the excursions "B" and "D", is recommended to those who feel an interest in the past culture and civilization of Japan. Nara, one time capital of our country during the 8th Century, is a treasurehold of classical Japanese architecture and sculpture, which have been miraculously preserved through the ages from the devastations of earthquakes and the ravages of wars. These monuments of ancient civilization manifest a marked influence of the continental culture of the T'ang Dynasty, traces of which are now actually almost extinct in present-day China itself. Visitors on this excursion will find themselves breathing the atmosphere of the past centuries among the deer roving lazily in the sacred precincts of the Kasuga Shrine, with its painted red colonnade and the bronze garden lanterns mellowed into a quiet green colour, in a setting of gently sloping hills.

The Ise Grand Shrine is the finest example of the original Japanese style of architecture, and through the centuries it has been rebuilt every twenty years without the slightest modification to its design, and still retains without a trace of adulteration the true Japanese style of construction, characterized by its elegance that is combined with simplicity.

Participants will also have the occasion on this tour to experience the contrast of the past and the present with a visit to the city of Nagoya, a bustling industrial centre, with a university established in comparatively recent years.

(See the map on page 28—29)



Excursion D

(YAMATO, ISE, "Japanese Alps",
Lake District around Mt. Fuji)

The tour begins with departure from Osaka in the early afternoon of 25 September, in conjunction with Excursions "B" and "C", and terminates with return to Tokyo in the afternoon of 3, October.

Rough estimate of expenses (all-inclusive): ¥40,000.

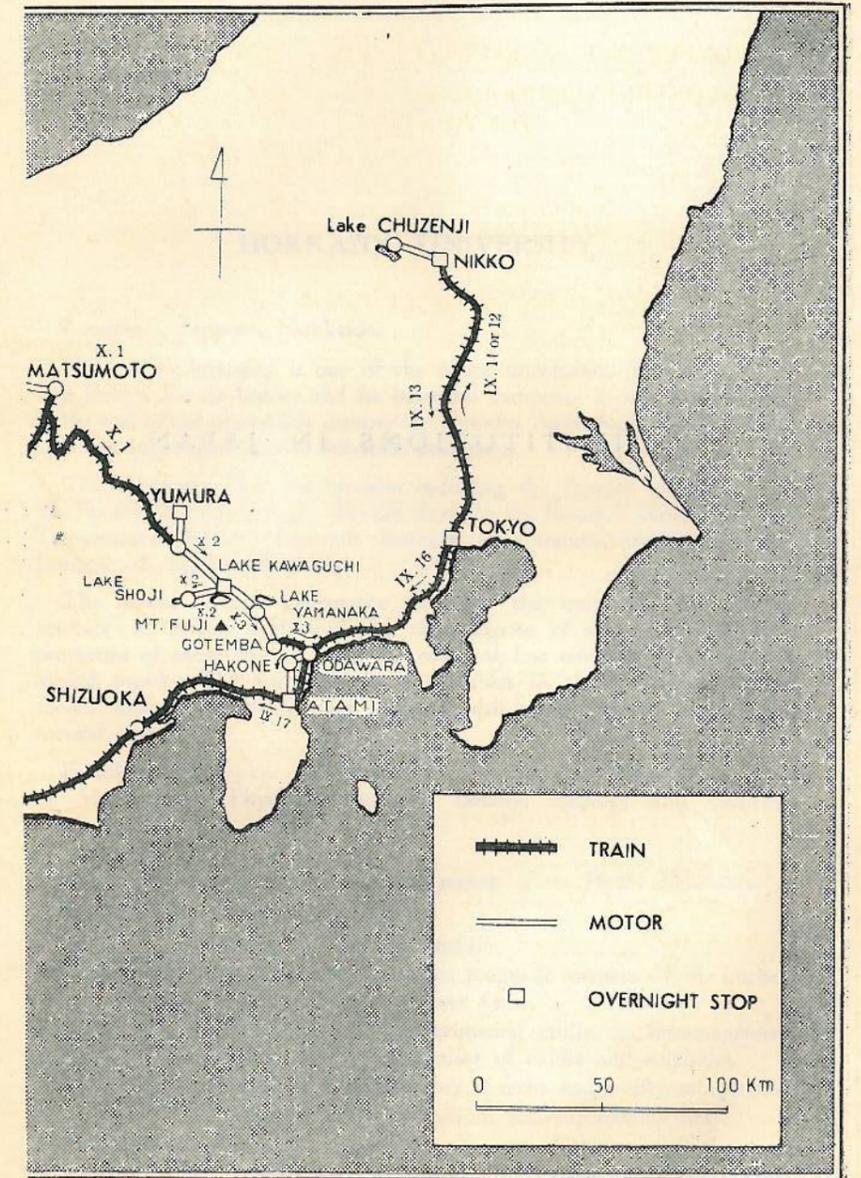
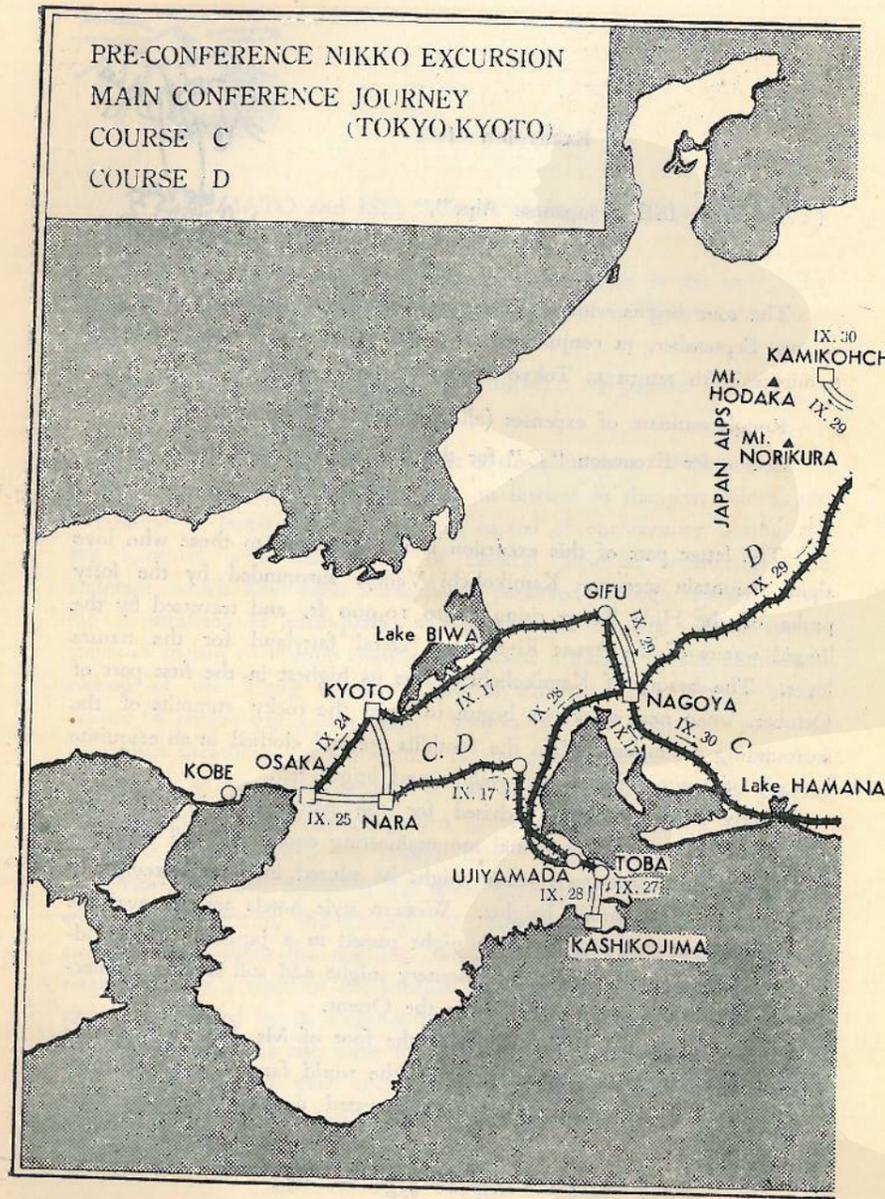
See under Excursion "C" for the first stage of this tour.

The latter part of this excursion is recommended to those who love alpine mountain scenery. Kamikohchi Valley, surrounded by the lofty peaks of the Hida Range rising up to 10,000 ft, and traversed by the limpid waters of the Azusa River, is a literal fairyland for the nature lover. The beauty of Kamikohchi attains its highest in the first part of October, when new snow has begun to cover the rocky summits of the surrounding mountains, while the foothills are still clothed in an exquisite brocade of autumn leaves, rich yellow and bright red.

Fairly warm clothing is advised for the participants in this tour, though of course no professional mountaineering equipment will be necessary, unless an adventurous visitor might be allured into an attempt to scale one of the towering heights. Western style hotels are not available in the region at this season, but a night passed in a Japanese inn standing amid the grandeur of natural scenery might add still another recollection to the experience of the trip to the Orient.

The visit to the Lake District at the foot of Mt. Fuji will provide the traveller with a magnificent view of the world famous volcano, which should be at its best in that season, silhouetted against a bright, clear autumn sky.

(See the map on page 26—27)



V. INSTITUTIONS IN JAPAN

HOKKAIDO UNIVERSITY

Location: Sapporo, Hokkaido.

Hokkaido University is one of the oldest universities in Japan. It is well known for its history and its beautiful campus. It was first founded in the end of the nineteenth century as Sapporo Agricultural School which later was developed into a full-scale university.

The university has ten faculties including the Faculty of Science and the Faculty of Engineering. Besides these are the Research Institute of Low Temperature Science, Research Institute of Catalysts, and the Research Institute of Applied Electricity.

The *Institute of Low Temperature Science* is the only one and unique institute in Japan established for the purpose of studying the physical properties of snow and ice, and the effect of low temperature in the biological world. The low temperature chambers in the Institute may be cooled down to -50°C and supplied with either artificial or preserved natural snow.

Established in 1930, the *Faculty of Science* has six departments, those of Mathematics, Physics, Chemistry, Botany, Zoology and Geology-Mineralogy.

The staff members and the main research projects of the Physics Department of interest to theoreticians are:

- Y. Ono:* Theory of non-local field.
- M. Sugawara:* Study of the anomalous magnetic moment of the nucleon and the static nuclear force.
- S. Miyahara:* Theoretical and experimental study on ferromagnetism and antiferromagnetism of oxides and sulphides.
- T. Matsubara:* Collective electron theory of ferro- and antiferromagnetism. Theory of liquid helium and superconductivity.
- J. Furuichi:* Properties of high polymers. Experimental study on dielectrics. Mechanism of photographic development.

- S. Shinohara*: Study on the electronic structure of the dislocation of alloys and superconductors.
K. Arakawa: Crystal growth of ice.
A. Soeya: Experimental studies on polymer solutions.

Research studies not belonging to the Physics Department but whose themes are of physical interest:

- T. Toya*: (Res. Inst. of Catalysts) Electrical conductivity of metals.
A. Kobayashi, T. Keii, T. Takaishi, K. Miyahara: (Res. Inst. of Catalysts) Theory of solid surface and adsorption.
H. Oura: (Res. Inst. of Low Temp. Sc.) Theory of nucleation of crystals.
N. Koda: (Faculty of Tech.) Theory of dislocation and plastic deformation.

TOHOKU UNIVERSITY

Location: Katahira-cho, Sendai.

Among the notable organizations of the Tohoku University, the following may be mentioned.

- 1) Physical Institute.
- 2) Research Institute for Iron, Steel and Other Metals.
- 3) Research Institute for Scientific Measurements.

Physical Institute, Faculty of Science

Established in 1910.

- Prof. M. Yamada, Ass. Prof. A. Morita*:
Theoretical and chemical physics.
Prof. Y. Takahashi, Ass. Prof. K. Nakamura:
Experimental studies in spectroscopy.
Prof. T. Hayashi, Ass. Prof. S. Kiyono:
Experimental studies of soft X-ray absorption in solids.
Prof. M. Kimura, Ass. Prof. T. Kitagaki:
Experimental studies of nuclear reactions in the low energy region.
Prof. K. Nakabayashi, Ass. Prof. I. Sato:
Theory of elementary particles.

Research Institute for Iron, Steel and other Metals

This Institute was established in 1916, through the efforts of Professor *K. Honda* and others, and has won fame for the numerous successful studies undertaken in the field of metal science.

The present staff comprises 150 research members, 120 laboratory workers and office staff members. Among the 21 divisions, 4 divisions concern physics of metals and 2 divisions are devoted to studies on the properties of matter in the very low temperatures.

1. Physics of Metals

- Prof. H. Masumoto, Ass. Profs. H. Saito and I. Oguma*:
Magnetic materials.
Prof. T. Hirone, Ass. Prof. S. Nagasaki:
Solid state.
Prof. Y. Shirakawa, Ass. Prof. T. Obara:
Magnetic materials.
Prof. M. Yamamoto, Ass. Prof. T. Susuki:
Ferromagnetism and plasticity.
Prof. T. Sutoki, Ass. Prof. T. Fujimura and T. Hikage:
Crystal plasticity.
Prof. S. Takeuchi, Ass. Prof. H. Susuki:
Physical metallurgy.
Prof. S. Ogawa:
Crystal physics.
Ass. Prof. H. Watanabe:
Ferro- and antiferromagnetism.
Ass. Prof. H. Sato:
Solid state.

The divisions for the study of the low temperature properties of metals and other materials were established in 1929. In August, 1952 a helium liquefier of Collins type (A.D. Little Inc.) was installed, which yields about 4 liters of liquid helium per hour. A large magnet (40 kW) is now under construction.

a) Division of low temperature physics.

Prof. T. Fukuroi, Ass. Prof. Y. Shibuya:
Low temperature physics of metals and alloys.

b) Division of low temperature chemistry.

Prof. E. Kanda, Ass. Profs. Y. Nomura and T. Sugawara:
Low temperature physics of solids and liquids.

Research Institute for Scientific Measurements

Location: 5 Gojo-Dori, Sendai.

This institute was established by the Ministry of Education on January, 1942.

The present staff members and research items concerning physical investigations are as follows:

Prof. T. Okamura: High Pressure Mechanics.
Prof. T. Hibi: Geometrical Optics.
Prof. Y. Tanabe: Physical Optics.
Prof. T. Matsuyama: Electronics.
Prof. T. Sakurai: Electricity and Magnetism.

UNIVERSITY OF TOKYO

University of Tokyo, once called Tokyo Imperial University before the World War II, is the oldest national university in Japan. Though it was established as a university in 1877, its origin dates back to the Tokugawa Shogunate (feudal) period.

At first, it consisted of four faculties—Faculties of Law, Science, Letters and Medicine. Afterwards other faculties were added to those above mentioned, and now the University has nine faculties: *Faculties of Science, Law, Letters, Medicine, Engineering, Economics, Agriculture, Education and General Culture.* Besides these faculties many institutes are attached to it. Among them may be mentioned: *Institute of Science and Technology, Institute for the Study of Cosmic Rays, Institute of Industrial Science, Tokyo Astronomical Observatory and Earthquake Research Institute.*

All the faculties except for that of General Culture are situated at Hongo in Tokyo. The site was formerly the estate of the feudal lord of Kaga Province, a trace of which can still be seen in the Red Gate which stands near the south-west corner of the campus.

Department of Physics, Faculty of Science

Location: Hongo Bunkyo-Ku, Tokyo.

The Department of Physics of Tokyo University together with that of Kyoto University played an important role during the period of establishing the foundations of physical science in Japan. Among outstanding professors in the past the following may be mentioned: late Emeritus Professors K. Yamakawa, A. Tanakadate, H. Nagaoka and S. Nishikawa.

Staff members and their research projects are as follows:

Prof. M. Hirata: Experimental Physics, Study of Rupture of Solids.
Prof. K. Honda: Electrical Discharges in Gases.
Prof. I. Imai: Mechanics of Continua, Theory of High Speed Flow and Turbulence.
Prof. S. Kaya: Physics of Metals, Ferromagnetism.
Prof. Z. Koana: Optics, Microphotography, Microphotometry.
Prof. M. Kotani: Theory of Structure of Molecules, Electronic Theory of Magnetism of Solids.
Prof. K. Ochiai: Statistical Mechanics of Solids and Liquids.
Prof. R. Sagane: Experimental Study in Nuclear Physics.
Prof. T. Sakai: Statistical Mechanics of High Polymers and Solutions, Superconduction, Superfluidity.
Prof. T. Yamanouchi: Theory of Atomic Spectra and Nucleus.
Ass. Prof. T. Kato: Mathematical Physics.
Ass. Prof. T. Kihara: Intermolecular Forces, Electrical Discharges.
Ass. Prof. R. Kubo: Statistical Mechanics, High Polymers.
Ass. Prof. G. Miyamoto: Nuclear Physics, Beta Rays, Mass Spectroscopy.
Ass. Prof. S. Nakamura: Field Theory, Theory of Nucleus.
Ass. Prof. K. Shimoda: Micro-wave Spectroscopy.
Ass. Prof. H. Takahasi: Electrets, Ferroelectricity, Servo Mechanism, Theory of Irreversible Processes.

Department of Physics, Faculty of General Culture

Location: Komaba, Meguro-ku, Tokyo.

Prof. J. Kimbara: Applied physics.
Prof. H. Tamaki: Theoretical physics.
Prof. M. Nogami: Field theory.
Ass. Prof. K. Takahashi: Applied physics.
Ass. Prof. S. Ueda: Low temperature physics.
Ass. Prof. S. Takagi: Electron and X-ray diffraction.
Ass. Prof. K. Ishiguro: Optics.
Ass. Prof. H. Kanazawa: Field theory and low temperature physics.
Ass. Prof. K. Ono: Field theory.
Ass. Prof. T. Kohra: X-ray and electron diffraction.
Ass. Prof. T. Usui: Theory of molecules and low temperature physics.

Department of Applied Physics, Faculty of Engineering

Location: Hongo, Bunkyo-ku, Tokyo.

Prof. T. Inui: Mathematical physics, colour centres.

Ass. Prof. *A. Amemiya*: Molecules, polymers.
Lecturer *T. Sato*: Mathematical physics.
Lecturer *T. Iizumi*: Atomic spectra.
Prof. *Y. Suge*, Ass. Prof. *Y. Wada*:
Applied Physics, Polymers.

The Institute of Science and Technology

Location: 856 Komaba-cho, Meguro-ku, Tokyo

The Institute of Science and Technology was founded in March 1946, as one of the nine research institutes attached to the University of Tokyo, with the purpose of having cooperative researches actively undertaken by pure and applied scientists in the academic as well as practical research fields.

The institute has inherited the campus and equipment of the former Aeronautical Research Institute of the University, which was abolished soon after the war. The research staff has been completely reorganized in accordance with the newly established plan of the institute.

The institute is divided into four branches of specified fields namely,

1. Physics.
2. Applied Chemistry and Metallurgy.
3. Applied Mechanics and Electrical Engineering.
4. Biochemistry and Biophysics.

In the branch of physics, research problems were hitherto mainly concentrated in the fields of molecular and solid state physics as well as applied physics, including acoustics and vacuum technique. In recent times, however, ardent efforts have been paid for the development of research projects in nuclear physics, the construction of a medium size cyclotron being now in progress.

Research staff members and main research projects in close connection with pure and applied physics are as follows:

Prof. *K. Sato*: Room-acoustics and noise-prevention.
Prof. *T. Muto*: Interaction of μ meson with matter, theory of nuclear shell model and high energy nuclear reactions, nuclear magnetic resonance absorption, electron theory of semiconductors.
Prof. *K. Murakawa*: Spectroscopic and nuclear magnetic resonance studies of nuclear magnetic moment.
Prof. *H. Kumagai*: Microwave studies on paramagnetic salts, nuclear physics.

Ass. Prof. *Y. Kakiuchi*: Nuclear magnetic resonance and molecular structure, quantum theory of chemical valency, electrical properties of semi-conductors.
Ass. Prof. *S. Sawada*: Ferroelectric crystals.
Ass. Prof. *J. Igarashi*: Acoustics.
Ass. Prof. *J. Yamashita*: Quantum theory of semi-conductors and dielectrics.
Prof. *S. Kaya*: Ferromagnetic superlattice alloys.
Prof. *I. Imai*: Mathematical physics. Theoretical aerodynamics.
Ass. Prof. *K. Ishiguro*: Metallic thin films and geometrical optics.
Ass. Prof. *H. Takahashi*: Ferroelectric crystals.
Prof. *T. Yamanouchi*: Differential analysers.
Ass. Prof. *S. Yasumi*: Microwave absorption of dielectrics and the molecular structure.
Prof. *S. Makishima*: Experimental studies of fluorescence and phosphorescence.
Ass. Prof. *K. Oshima*: Experimental studies of fluorescence and phosphorescence.
Ass. Prof. *S. Nagakura*: Electronic structure of conjugate compounds.
Ass. Prof. *T. Shimanouchi*: Infrared spectroscopy and molecular structure.

TOKYO UNIVERSITY OF EDUCATION

Location: 56 Kubomachi, Bunkyo-ku, Tokyo.

The Tokyo University of Education was established in 1949 by unifying the *Tokyo Bunrika University* with other several colleges. It comprises the Faculties of Science, Literature, Education, Agriculture and Gymnastics under the President, Naoshi Shibamura. Attached to the University are the Institute for Optical Research, the Marine Laboratory and the Institute for Plateau Biology. The Departments of Mathematics, Physics, Chemistry, Biology and Geology are in the Faculty of Science under the Dean, Dr. Yoshio Fujioka. The following is a guide to the laboratories belonging to the Department of Physics.

Staff members and their research projects:

1. Theoretical Physics.
Prof. *S. Tomonaga*, Prof. *T. Miyajima*, Ass. Prof. *H. Fukuda*, Ass. Prof.

N. Fukuda, Lecturer *R. Suzuki*, Lecturer *E. Ito* :
Intermediate Coupling, π -Nucleon Scattering, γ -Deuteron
Dissociation, Deuteron Problems.

Prof. *M. Toda* : Electron Theory of Solids, Superconductivity and Liquid
Helium, Theory of Liquids and High Polymers.

2. Experimental Physics.

Prof. *M. Miwa*, Lecturer *S. Kageyama* : X-Ray Study on Cold Work,
Study of Nuclear Energy Levels by β -ray Spectrometer,
Preliminary Experiments on β -tron, Intensity and Con-
trast of the Image with Electron-Microscope.

Prof. *S. Kojima* : Nuclear Quadrupole Resonance Study on Br. Distri-
bution of the Energy of β -rays by Scintillation Method,
Electron Avalanche in Gas-Discharge.

3. Institute for Optical Research.

Prof. *Y. Fujioka*, Prof. *Y. Tanaka*, Ass. Profs. *M. Seya*, *R. Ito*, *S. Hachisu*,
Lecturer *T. Kitayama* : Infrared Spectroscopy, Ultra-
violet Spectroscopy, Properties of Zinc Black, Artificial
Pearls, Studies on Sky Light, Artificial Large Crystals,
Physics of Odour.

Publication :
"Science of Light" (Reports).

TOKYO METROPOLITAN UNIVERSITY

Location : 591 Fusuma-cho, Meguro-ku, Tokyo.

This University was established in 1949 following a plan of the Tokyo
Metropolitan Government to integrate 6 colleges then found in the
Tokyo metropolis, and is the only university which belongs to the
Tokyo metropolitan government. It started with staff and buildings
appropriate for a four year undergraduate course. In 1951 a new
building was added to the university at Fusuma-cho, Setagaya-ku for the
Faculty of Science. The Technological Department is at Samezu, Ota-ku.
In 1953 a two year advanced course was provided.

Department of Physics, Faculty of Science

Research members and research items :

1. Theoretical Physics :

Prof. *M. Sasaki* : Nuclear force, nuclear reaction, meson production.
Prof. *T. Nagakura* : Applied mechanics and aerodynamics.
Prof. *H. Hayashi* : Applied mathematics and aerodynamics.

2. Experimental Physics :

Prof. *E. Fukushima* : Applied physics, dislocation of metals, X-ray analysis.
Prof. *R. Kimura* : Metal physics, magnetism.
Prof. *T. Sato* : Metal physics in quantum mechanics.
Prof. *K. Kido* : Magnetism—diamagnetism of chemical compounds.
Prof. *I. Kanomata* : Mass spectroscopy and experimental nuclear physics.
Prof. *M. Kiuchi* : Optics and spectroscopy.

GAKUSHUIN UNIVERSITY

Location : Mejiro, Toshima-ku, Tokyo.

The origin of Gakushuin, formerly known as the Peers' School, dates
back to the middle of the nineteenth century. It is situated in a quiet
part of Tokyo, and started in 1949 as a co-educational institute with a
fouryear university course.

The dean of the Department of Physics and Chemistry is Prof. *K. Sato*,
and the staff members and their research items in the Department of
Physics are as follows :

Prof. *M. Kondo* : Scientific Measurement.
Prof. *A. Ookawa* : Theory of Plasticity, Theory of Liquids.
Prof. *K. Kinoshita* : Surface Physics, Optics.
Prof. *S. Chikazumi* : Magnetism and Magnetic Alloys.
Ass. Prof. *S. Hara* : Ferroelectricity, Scientific Measurement.

RIKKYO UNIVERSITY (St. Paul's University)

Location : 3-chome, Ikebukuro, Toshima-ku, Tokyo.

This university, situated in the north-western part of Tokyo, was esta-

ublished in 1874 through the efforts of Dr. Williams. The educational policy of this university is based on the Christian spirit.

It consists of three colleges: College of Literature, College of Economy and College of Science.

Department of Physics, College of Science

The College of Science was added to the University in 1949. The research projects in the Department of Physics covers several fields of physics, with special emphasis on atomic physics.

The staff members and their research items are as follows:

Dean Prof. S. Nakagawa :	
Prof. Y. Sugiura :	Optics.
Prof. S. Nakagawa :	Cosmic Rays at high altitude by nuclear plates.
Prof. M. Taketani :	Theoretical Nuclear Physics.
Prof. S. Watanabe :	Field Theory (now abroad.)
Prof. E. Tajima :	Experimental Nuclear Physics by Cyclotron.
Ass. Prof. T. Toyoda :	Meson Theory.
Ass. Prof. M. Hosoe :	Field Theory.
Ass. Prof. K. Aidzu :	Meson Theory.
Ass. Prof. N. Oda :	Field Theory.
Lecturer M. Tsukuda :	Micro-wave Technics.
Lecturer H. Huzita :	Cosmic Rays.
Lecturer K. Okudaira :	Cosmic Rays.
Lecturer E. Tamai :	Cosmic Rays.

TOKYO INSTITUTE OF TECHNOLOGY

Location: Oh-Okayama, Meguro-ku, Tokyo.

The Institute was originally established by the Ministry of Education in May 1881 under the name of Tokyo Trade School. In April 1929, the school was promoted to the rank of university and renamed Tokyo Institute of Technology. The Institute is located at Oh-Okayama, 4 miles to the west of the centre of Tokyo.

The following 10 courses are given: Mathematics, Physics, Chemistry, Mechanical Engineering, Textile Engineering, Electrical Engineering, Metal Engineering, Chemical Engineering, Architectural Engineering and Administrative Engineering.

The *Physics Department* includes four professors, six assistant professors, one lecturer and sixteen assistants. Those among them who are engaged in researches in the fields of theoretical physics, solid state physics and nuclear physics are as follows:

Prof. A. Harasima :	Statistical Mechanics of Liquids, Theory of Liquid Helium.
Ass. Prof. K. Niira :	Electronic States of Molecules, Electronic Energy of Solids, especially Ultra-violet Absorption.
Ass. Prof. R. Nosawa :	Quantum Statistical Mechanics.
Ass. Prof. H. Ichimura :	Quantum Statistical Mechanics, Theory of Superconductivity.
Lecturer T. Oguchi :	Theory of Solid, especially Phase Change, Ferromagnetism.
Prof. S. Miyake :	X-ray and Electron-ray Crystallography, Phase Transition and Lattice Imperfections of Crystals.
Prof. Y. Takagi :	Investigations on Ferroelectrics such as BaTiO ₃ , and Antiferroelectrics such as PbZrO ₃ , Investigations on Ferrites.
Ass. Prof. E. Takeda :	Isotope Separation and Nuclear Physics.
Ass. Prof. G. Honjo :	X-ray and Electron-ray Crystallography, Electron Wave Optics.

THE SCIENTIFIC RESEARCH INSTITUTE, LTD.

(Formerly: The Institute of Physical and Chemical Research)

Location: 31 Kamifuji-cho, Bunkyo-ku, Tokyo.

This institute was established in 1917 with a view to promote purely scientific as well as practical investigations. Since then the institute has made remarkable contributions to the physical and chemical sciences. Among the notable contributions the following may be mentioned: X-ray and electron diffraction experiments of Dr. M. Nishikawa and Dr. S. Kikuchi, theoretical investigations by Dr. Y. Nishina and Dr. S. Tomonaga on atomic nuclei and quantum mechanics, and studies on steel and magnetism of Dr. K. Honda.

After the end of World War II, the former organization was abolished and the present institute was organized. Since then stress was laid upon the practical application of scientific researches.

It has 36 laboratories, of which the 5 following laboratories are mainly

concerned with physical researches as shown below :

- Y. Suge's Laboratory : Physico-chemical properties of solutions of high polymers.
K. Shinohara's Lab. : Semiconductors and electrets and their practical uses.
A. Sugimoto's Lab. : Radioactive isotopes, condensation of heavy nitrogen and oxygen.
F. Yamazaki's Lab. : Artificial radioactive substances and their practical uses.
Y. Fujioka's Lab. : Infrared gas analyser, applications of diffraction grating.

Important equipment in these fields are :

- Cyclotron : 4 MeV (deuteron), 24 tons,
Apparatus for the condensation of N^{15} by chemical exchange,
Mass Spectrometer,
Cosmic ray apparatus (for continuous measuring).

KOBAYASI INSTITUTE OF PHYSICAL RESEARCH

Location : Kokubunji-machi, Kitatama-gun, Tokyo.

This Institute is located at Kokubunji, 15 miles to the west of Tokyo. The Institute maintains a staff of about 50 members, including 34 physicists, several office-clerks and workmen. They are divided into 6 sections, the research items and the chiefs being as follows :

- Section 1. Molecular Physics (Dr. S. Oka)
Section 2. Ultrasonics (Dr. O. Nomoto)
Section 3. Ferroelectric Materials (Dr. H. Kawai)
Section 4. Acoustics (Dr. Y. Kobashi)
Section 5. X-ray and Electron Diffraction (Dr. H. Hagihara)
Section 6. Theory of Elementary Particles (Dr. S. Tomonaga)

The equipment, books and periodicals necessary for these researches are furnished. The results obtained are published in "Bulletin of the Kobayasi Institute of Physical Research" or in other scientific publications. Some devices have been put to practical use in the products of "Kobayasi Riken Seisakusyo Company", and other factories.

The Institute was established in 1938 when U. Kobayasi, a colliery owner, made a donation towards the fund. Since 1940, it has been a foundation juridical person, managed by a board of directors. The present

chief director is Professor K. Sato. The current expenditures are furnished partly by government subsidies, and partly by patent and consultation fees.

Concerning Theoretical Physics, researches in the fields of high polymer physics, statistical thermodynamics and molecular structures are being conducted. The staff members of the Theoretical Physics Laboratory and their subjects under investigation are :

- S. Oka, D. Sc. : High Polymer Physics.
I. Oshida, D. Sc. : Structure of Matter.
Y. Ooshika, M. S. : Molecular Structure.
Y. Ikeda, M. S. : Electrokinetics.
O. Nakata, M. S. : Dielectrics.
M. Sugita, D. Sc. : Thermodynamics of Irreversible Processes.
A. Ookawa, M. S. : Crystal Plasticity.
N. Saito, M. S. : Statistical Thermodynamics of High Polymer Solutions.
S. Kataoka, M. S. : Polyelectrolytes.

NAGOYA UNIVERSITY

Physical Institute, Faculty of Science

Location : Chikusa-ku, Nagoya.

(Founded in 1942)

(A). Institute of Theoretical Physics.

Group I.

Subject : Theory of Elementary Particles. Theoretical Nuclear Physics.
Research Staff : Prof. S. Sakata, Ass. Prof. H. Umezawa.

Group II.

Subject : Theory of Superfluid and Superconductivity. Theory of Solid State.

Research Staff : Prof. K. Ariyama, Ass. Prof. S. Nakajima.

Group III.

Subject : History of Physics, in particular the Theoretical Development of Atomic Physics and Quantum Theory.

Research Staff : Ass. Prof. T. Takabayashi, Lecturer T. Sugawara.

(B). *Physical Laboratory.*

Group I.

Subject: Origin of Cosmic Rays. Geophysical Research of Cosmic Rays. Research of Nuclear Interaction of Cosmic Rays.

Research Staff: Prof. Y. Sekido, Ass. Prof. I. Miura; T. Masuda.

Equipment: Cosmic ray counter telescope
Rotating cosmic ray counter telescope
Cloud Chamber and hodoscope

Group II.

Subject: Optics of Electron Diffraction. Ferroelectricity.

Research Staff: Prof. R. Uyeda; Ass. Prof. H. Yoshioka, K. Kimoto.

Equipment: Electron Diffraction Camera of High Resolution.
Electron Diffraction Camera with Rotating Sector.
Electron Microscope.
Geiger Counter. X-ray Spectrometer.

Group III.

Subject: Theoretical and Experimental Studies on Solutions of High Polymers, especially Theories of Polyelectrolyte Solutions, Studies of Ultrasonic, Light Scattering, Flow Birefringence, Dielectrics Properties, and Structure Viscosity of High Polymer Solutions.

Research Staff: Ass. Prof. F. Oosawa.

Equipment: Equipment for ultrasonic measurements by pulse method.
Equipment for dielectric measurements.
Equipment for flow birefringent measurements.
Equipment for light scattering measurements by photographic method.

KYOTO UNIVERSITY

Location: Kitashirakawa, Sakyo-ku, Kyoto.

The Kyoto University was inaugurated in 1897 as the second national university in Japan, the first one being established in Tokyo ten years earlier. Since then it became full-fledged in its work as well as in its organization, having in all the eight autonomous Faculties of Law, Medicine, Literature, Economics, Science, Engineering, Agriculture and Education. Thus for more than half a century, the university has taken the lead in the various fields of activities, keeping ahead with the developments and tend-

encies of the times. In the meantime, moreover, in addition to the increasing number of departments in the respective Faculties, there have been set up one after another various affiliated research facilities for the fields of science and the humanities, such as laboratories, observatories, experimental forest stations, and farms, numbering 28 in all.

Staff members and Projects of Laboratories concerning Theoretical Physics and Chemical Physics are as follows:

Physics Department, Faculty of Science

Prof. M. Kobayashi, Ass. Prof. S. Takagi, Lecturer Y. Fujimoto:
Field Theory and Nuclear Physics.

Prof. H. Yukawa, Ass. Prof. K. Inoue:
Field Theory, Theory of Mesons, Nuclear Physics.

Prof. M. Kotani, Ass. Prof. K. Tomita:
Theory of Molecules, Magnetism and Very Low Temperature Phenomena.

Prof. S. Tomotika, Ass. Prof. K. Tamada:
Hydrodynamics.

Prof. Y. Uchida, Prof. M. Ueta:
Spectroscopic Investigations of Molecules and Semiconductors. X-ray, Electron Diffraction.

Prof. I. Takahashi, Ass. Prof. A. Okaya:
Microwave spectroscopy Electronics.

Prof. K. Kimura, Prof. S. Shimizu, Ass. Prof. R. Ishiwari:
Experiments on Nuclear Physics.

Chemistry Department, Faculty of Science

Ass. Prof. T. Yamamoto: Statistical Mechanics of time-dependent phenomena. High-polymers.

Department of Industrial Chemistry,
Faculty of Engineering

Prof. G. Araki, Ass. Prof. K. Mano (now in U.S.A.): Quantum Chemistry, Nuclear Physics.

Prof. M. Tamura, Lecturer K. Kubota, Lecturer M. Kurata: Cooperative Phenomena. Polymer Solutions. Surface Tension.

OSAKA UNIVERSITY

Location : 4-chome, Nakanoshima, Kita-ku, Osaka.

Osaka University, being established in 1932, is one of the younger national universities of Japan. It has six faculties : Medicine, Technology, Science, Literature, Economics and Law. Two research institutes, Institute of Scientific and Industrial Research, and Institute of Microbe Research belong to the university.

The Faculty of Science, located at Nakanoshima, Kita-ku, Osaka, in the midst of a rather non-academic environment in the city centre, is most active in academic as well as in applied researches. It consists of four departments : Mathematics, Physics, Chemistry and Biology, and has about 200 official research members.

The present professors of the *Department of Physics* are :

<i>T. Asada</i> (Applied physics),	<i>S. Kikuchi</i> (Nuclear physics),
<i>K. Okabe</i> (Microwave),	<i>T. Watanabe</i> (Crystal structure),
<i>Y. Watase</i> (Cosmic ray),	<i>M. Sawada</i> (X-ray),
<i>T. Nagamiya</i> (Theoretical physics),	<i>K. Husimi</i> (Theoretical physics),

of whom the last two are in charge of theoretical studies.

Nagamiya Laboratory is concerned with various topics in the domain of chemical physics :

Prof. *T. Nagamiya*, Ass. Prof. *K. Yoshida* :

Ferro- and ferri-magnetism, colour centre, phase transitions in molecular crystals.

Husimi Laboratory is concerned with fundamental and mathematical studies, and divides itself into two groups :

Field Theory Group, headed by Ass. Prof. *R. Utiyama* :
Field Theory.

Statistical Mechanics Group headed by Prof. *K. Husimi* :
Statistical Mechanics, Quantum Hydrodynamics.

There are two special facilities to be mentioned :

Yukawa Memorial Room. This is a small-scale room established in the University's main building, for the purpose of promoting fundamental theoretical researches along principles laid down by Prof. *Yukawa*, who gave birth to his famous Nobel prize paper in 1930 at this University.

A new *Cyclotron* of 45 tons, 10 MeV deuteron, this under construction, and a high pressure Van de Graaf and Cockcroft-Walton, both belong to the *Kikuchi Laboratory*. A large scale mass spectrometer is under construction. A small-size betatron (4 MeV) is operating.

OSAKA CITY UNIVERSITY

Department of Physics, The Institute of Polytechnics

Location : 12 Minami-Ogimachi, Kita-ku, Osaka.
(Established in 1949)

Stress is laid upon the close correlation between the scientific and the engineering departments.

Organization :

Profs.	<i>Y. Watase</i> ,	Cosmic Rays.
	<i>T. Okuda</i> ,	Low Temperature.
	<i>J. Kakinoki</i> ,	High Polymers.
	<i>Y. Nanbu</i> ,	Elementary Particles.
	<i>H. Kawamura</i> ,	Semi-conductors.

Ass. Profs.	<i>T. Ojio</i> ,	Cosmic Rays.
	<i>S. Ozaki</i> ,	Cosmic Rays.
	<i>M. Oda</i> ,	Cosmic Rays.
	<i>Y. Hayakawa</i> ,	Elementary Particles.
	<i>K. Kusumoto</i> ,	Metallurgy.
	<i>Y. Saito</i> ,	Oceanography.
	<i>Y. Ko</i> ,	Nucleus.
	<i>M. Tomura</i> ,	Semi-conductors.
	<i>Y. Shibaoka</i> ,	Aerodynamics.

Lecturers	<i>H. Shibata</i> ,	Cosmic Rays.
	<i>S. Miyake</i> ,	Cosmic Rays.
	<i>T. Kikuchi</i> ,	Semi-conductors.
	<i>K. Okumura</i> ,	Magnetism.
	<i>T. Takakura</i> ,	Solar Noise.
	<i>Y. Yamaguchi</i> ,	Elementary Particles.

Adjunctive Equipment :

Mt. Norikura Cosmic Ray Observatory
Underground Cosmic Ray Observatory
Industrial Air-liquefier
(including Rectifier of Oxygen and Nitrogen)

KOBE UNIVERSITY

Department of Physics

Location: Mikage, Higashinada, Kobe.
(Founded in 1948)

Present research items and staff members:

1. Experimental Researches on Nuclear Magnetic Resonance.
Ass. Prof. T. Kanda.
2. Experimental Researches on Cosmic rays.
Prof. S. Minakawa.
Ass. Prof. T. Kameda.
Ass. Prof. G. Fujioka.
Ass. Prof. I. Kita.
3. Theoretical Researches on Elementary Particles and in Quantum Field Theory.
Prof. Y. Tanikawa.
Ass. Prof. G. Takeda.
Lecturer T. Taniuti.

HIROSHIMA UNIVERSITY

University of Hiroshima was founded in 1949 integrating Hiroshima University of Literature and Science and several other colleges. It consists of seven faculties—Literature, Education, Politics and Economics, Science, Technology, Fishery and Animal Husbandry, Medicine—, Minami Division (general culture) and Research Institute of Theoretical Physics.

Location: Higashisenda-machi, Hiroshima.

- Prof. T. Maekawa: Mechanics, Hydrodynamics.
Prof. K. Sakuma: Theoretical Physics, Theory of Elementary Particles.
Prof. H. Takeyama: Spectroscopy.
Prof. T. Fujiwara: Crystal Physics of Metals.
Prof. H. Tazaki: Electron Diffraction and X-ray.
Prof. E. Tatsumoto: Magnetism.

Research Institute of Theoretical Physics

Location: Takehara-machi, Hiroshima-prefecture.

Research Institute of Theoretical Physics, Hiroshima University of Science and Literature, was founded in 1944 and removed to Terahara-machi in 1946, being greatly damaged by the atomic bomb in 1945. It was transferred to Hiroshima University in 1949.

Prof. Y. Mimura: Fundamental Theory of Physics, Unified Field Theory.
Prof. H. Takeno: Geometry, Theory of Physical Space-Time.

KYUSHU UNIVERSITY

Location: Hakozaki-machi, Fukuoka.

The Kyushu University was established in March 1903 Fukuoka College of Medicine attached to the Kyoto University. In 1911 the College of Engineering was established. These two were amalgamated to constitute the Kyushu Imperial University in 1919 and the Faculty of Agriculture was added to it later. In September 1924, the Faculty of Law and Letters was established. The Faculty of Science was added in February, 1925.

Department of Physics, Faculty of Science

- Prof. S. Ozaki, Ass. Prof. T. Eguchi:
Field Theory and Theory of Nucleus.
Ass. Prof. T. Tanaka: Theory of Solid and Fluid State.
Ass. Prof. T. Okada: Dielectric Properties of Solids.
Prof. I. Nonaka, Ass. Prof. S. Morita:
Inelastic Scattering of Neutrons.

Institute of Applied Science, Faculty of Engineering

- Ass. Prof. S. Ono: Statistical Mechanics in General, Quantum Statistical Mechanics.

Research Institute of Science and Industry

- Prof. K. Oomori: Electronic Structure of Molecules, Catalytic Action of 3d Electrons.

SHIZUOKA UNIVERSITY

Location: Oote-machi, Shizuoka.

This University was established in 1949 by integrating several colleges in Shizuoka Prefecture.

Department of Physics, Faculty of Liberal Arts & Science

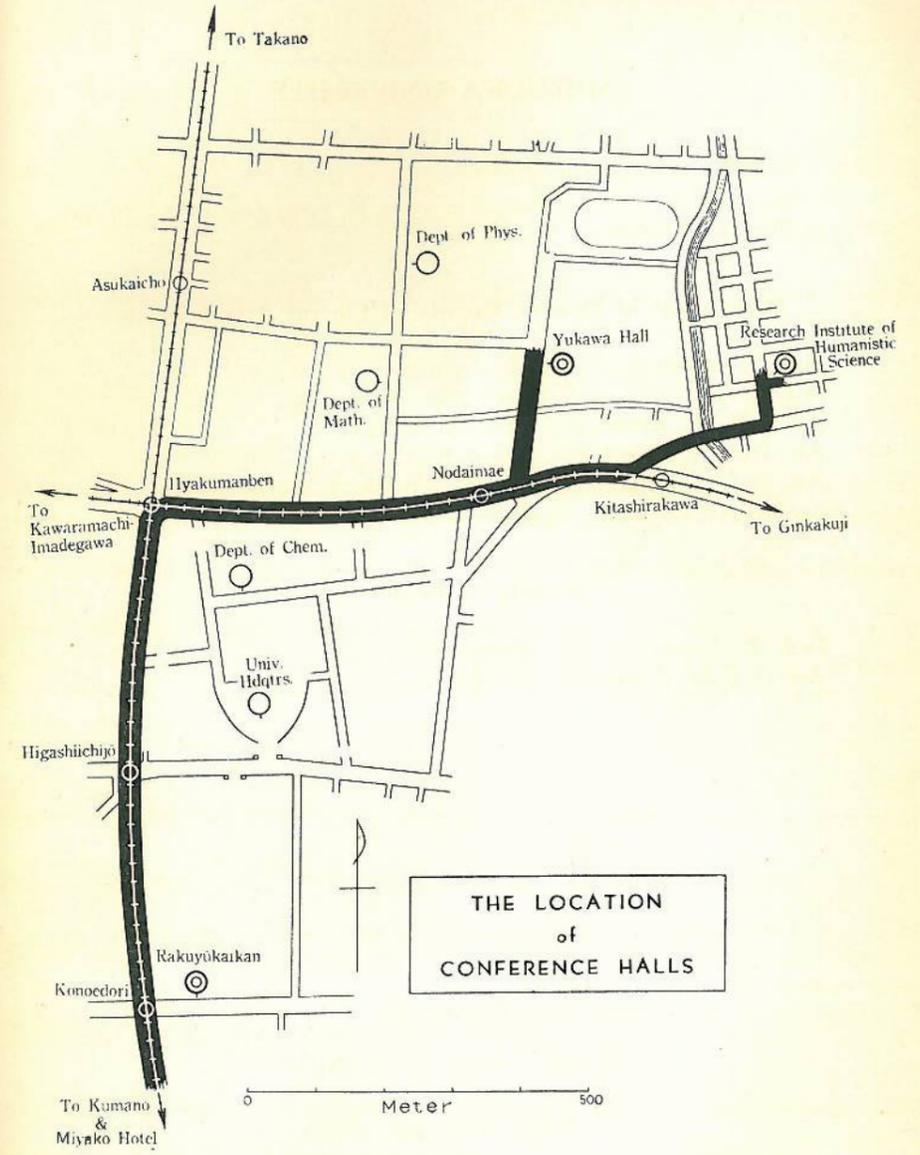
- Prof. T. Matoba: Metal physics.
- Prof. K. Uno: Geophysics, Meteorology.
- Ass. Prof. K. Yamamoto: Optics & X-Rays.
- Ass. Prof. H. Hasegawa: Cosmic Rays.
- Ass. Prof. A. Miyake: Chemical Physics of Macromolecules.
- Lecturer K. Yoshihama: Radio Electronics.

Faculty of Engineering

- Prof. T. Tamura: Electronics.
- Ass. Prof. H. Nabeshima: X-Rays.

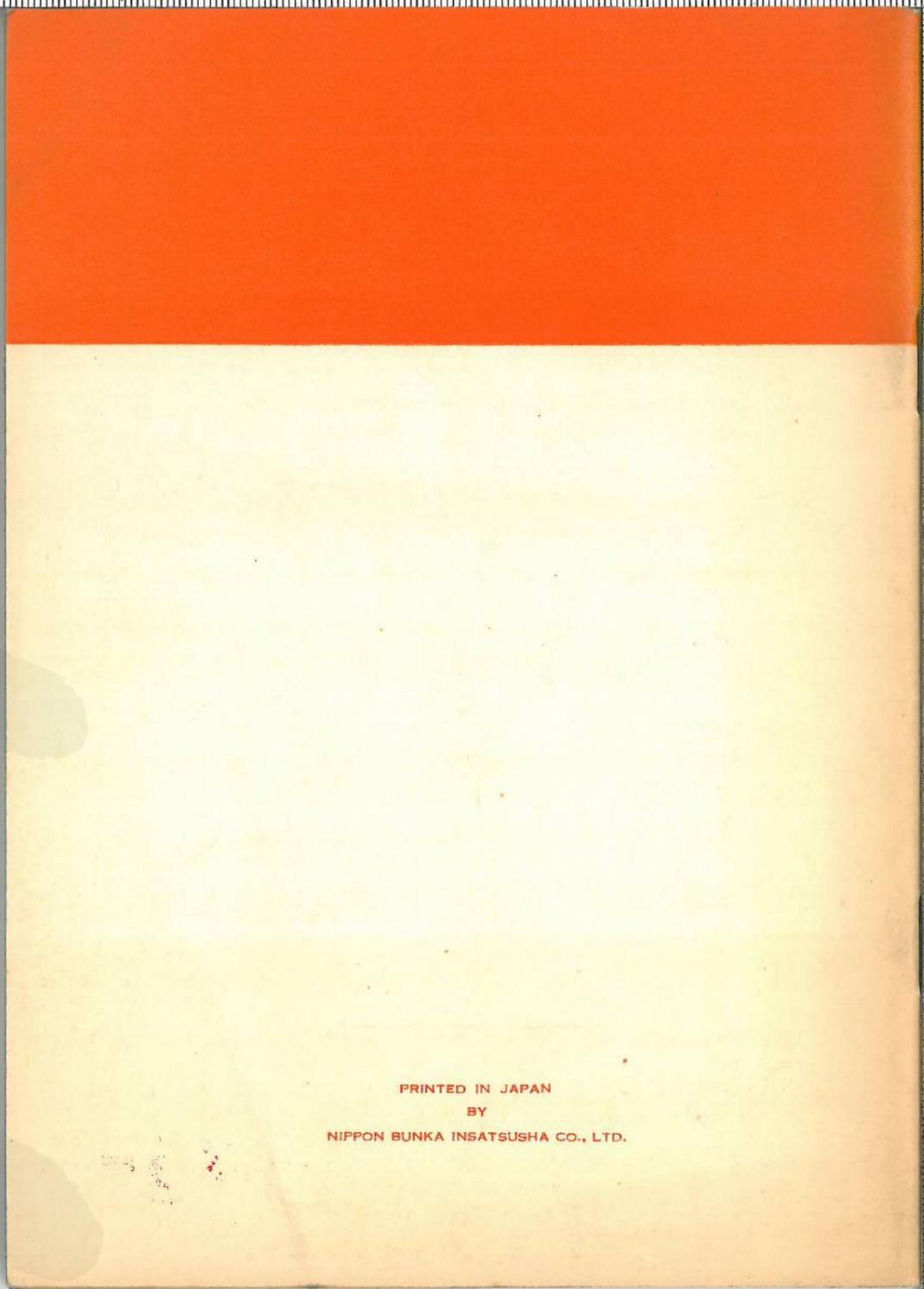
Published by
THE ORGANIZING COMMITTEE

Tokyo, September 1953.





©2022 YHAL, YITP, Kyoto University
京都大学基礎物理学研究所 湯川記念館史料室



PRINTED IN JAPAN
BY
NIPPON BUNKA INSATSUSHA CO., LTD.

