

## Preface

At the 12th General Assembly of the International Union of Biological Sciences (IUBS) held at Nice, France in 1953, it was agreed that a symposium on the subject of genetics should be organized in Japan. The decision was confirmed shortly thereafter by the 9th International Congress of Genetics held at Bellagio, Italy.

Japan became a member nation in the International Union of Biological Sciences in 1923, and has been cooperating with the Union through the Science Council of Japan (JSC) as the representative national organization of the Japanese scientists. This Council accepted the resolution of the International Union of Biological Sciences after carefully weighing the matter and coordinating with the government departments concerned and the academic societies in this country, and having arrived at the firm conviction that such a symposium would not only contribute to the progress of the studies in genetics, but would also stimulate the general advance in the cultural and scientific activities as well as leave telling effects on manifold branches of our industry. Thus the meetings have come to be held under the sponsorship of the Science Council of Japan with the assistance from the International Union of Biological Sciences in Tôkyô and in Kyôto from the 6th to the 12th of September, 1956.

As explained in the opening address by Dr. Kihara, Chairman of the Organizing Committee of the Science Council of Japan, the meetings were held in two sections, Section I being a symposium under the auspices of the IUBS on Physical and Chemical Approaches to Problems in Chromosomes, and Section II being another symposium dedicated to Problems in Applied Genetics as organized by the JSC with the understanding of the IUBS (Ref. Programme, p. XIV ). The official language was English.

The agenda consisted of the following :

### Section I. IUBS International Symposium on Physical and Chemical Approaches to Problems in Chromosomes

- Session A. Chromosome Structure and Mitosis
- B. Chemistry of Chromosomes
- C. Cytological Aspects of Cancers

Joint-session A, B and C

### Section II. JSC International Symposium on Problems in Applied Genetics

- Session A. Induced Mutation
- B. Polyploidy
- C. Heterosis
- D. Resistance
- E. Polygenic Inheritance
- F. Microorganisms and Viruses
- G. Blood Groups

Joint-session A and B

- Induced Mutation and Polyploidy
- Joint-session C and E
- Heterosis and Polygenic Inheritance.
- Joint-session D, F and G
- Resistance, Microorganisms and Viruses, and Blood Groups

Section I consisted of three separate sessions and one joint-session, and was participated in by 45 persons from seven countries, who read 33 papers in all which were followed by discussion. Section II consisted of seven separate sessions and four joint-sessions, and was participated in by 193 persons from 12 countries and 94 papers were read which were followed by discussion. In addition there were 13 special lectures given. The present Proceedings contain all these papers.

During the sessions of these symposia, exhibits were given at several places in Japan presenting materials of interest to the geneticists, particularly those objects peculiar to Japan or specially studied in this country. These consisted of the following: Japanese morning glory, radish, rice, wheat, goldfish, long-tailed fowl, silkworm and old documents.

An informal meeting was held on the standardization of nomenclature and symbols of genes. Preceding and following the symposia, public lectures were given at various places in Japan, primarily by the guest geneticists from abroad. Several excursions were also planned and carried out.

The present Proceedings do not duplicate the publications of expositions on the exhibits as these were published during the sessions of the symposia. Neither are the public lectures and minutes of the informal meetings are carried in these Proceedings.

The present Proceedings have been edited and are being published by the Organizing Committee as a Supplement Volume of *Cytologia*, the International Journal of Cytology. The papers read in the Section I of the symposia are published by the International Union of Biological Sciences as *Union Internationale des Sciences Biologiques, Série B (Colloques) N° 26, Physical and Chemical Approaches to Problems in Chromosomes, 1957*. All these papers are carried in the present Proceedings with the understanding of the International Union of Biological Sciences.

Yosito Sinotô  
Secretary, Organizing Committee

## MEMBERS OF THE ORGANIZING COMMITTEE

Chairman: Hitoshi KIHARA

Vice-chairman: Yo K. OKADA

Secretary: Yosito SINOTÔ

Hiroto HONDA

ASAMI, Yoshichi, Professor Emeritus, University of Tokyo

FURUHATA, Tanemoto, Professor, Faculty of Medicine, Tokyo Medical and Dental University

HIRATSUKA, Eikichi, Director, Silk Science Research Institute

KAYA, Seiji, President, Science Council of Japan

KIHARA, Hitoshi, Director, National Institute of Genetics

KOBARI, Kisaburo, Advisor, Katakura Kogyo KK.

KOGURE, Makita, Professor, Tokyo University of Agriculture and Textile Industry

KOMAI, Taku, Head, Department of Physiological Genetics, National Institute of Genetics

MAJUI, Kiyoshi, Professor, Faculty of Agriculture, Nagoya University

MORINAGA, Toshitaro, Director, National Institute of Agricultural Sciences

NAKAMURA, Kenji, Professor, Faculty of Science, Kyoto University

NOGUTI, Yakiti, Professor, Faculty of Agriculture, University of Tokyo

OGUMA, Kan, Professor Emeritus, Hokkaido University

OKADA, Yo K., Director, National Science Museum

SINOTÔ, Yosito, Professor, International Christian University

TANAKA, Yoshimaro, Head, Department of Morphological Genetics, National Institute of Genetics

TERADA, Masanaka, President, The Tokyo Jikei-kai School of Medicine

WADA, Bungo, Professor, Faculty of Science, University of Tokyo

MATSUMOTO, Shigeharu, Director, International House of Japan

YUASA, Hachiro, President, International Christian University

INADA, Seisuke, Director, Higher Education and Science Bureau, Ministry of Education

YAMAGUCHI, Masayoshi, Director, Public Sanitation Bureau, Ministry of Health and Welfare

MATSUI, Sashichiro, Chief, Third Section, International Cooperation Bureau, Ministry of Foreign Affairs

SHIMIZU, Shigeru, Planning Officer, Research Division, Agricultural Improvement Bureau, Ministry of Agriculture and Forestry

MUTO, Yoshio, Secretary General, Japanese National Commission for Unesco

SHINDO, Koichiro, Secretary General, University of Tokyo

HONDA, Hiroto, Secretary General, Science Council of Japan

TAKESHITA, Toshio, Deputy Secretary General, Science Council of Japan

SEKIMOTO, Takeo, Chief, General Affairs Division, Science Council of Japan

WATANABE, Katsumi, Chief, Intelligence Section, Science Council of Japan

# International Genetics Symposia, 1956

## PROGRAMME

6 September, Thursday

9:30-12:00	<b>Opening session</b>	Central Auditorium, University of Tokyo
	Opening address	Dr. Hitoshi KIHARA Chairman, Organizing Committee
	Welcome address	Dr. Seiji KAYA President, Science Council of Japan
	Welcome address	Dr. Taku KOMAI Representing Japanese Geneticists
	Message	Dr. Ichiro KIYOSE Minister of Education
	Message	Mr. Eizo KOBAYASHI Minister of Welfare
	Message	Dr. Ralph E. CLELAND Representing Foreign Participants
	Message	Mr. Ajit Prasad Jain Minister for Food and Agriculture, Government of India
	Message	The Indian Society of Genetics and Plant Breeding
	Message	Dr. S. HÖRSTADIUS President, International Union of Biological Sciences

—Interval 10 minutes—

### Special lectures:

Chairman: Hitoshi KIHARA

G. W. BEADLE: Gene structure and gene function

Yoshimaro TANAKA: Genetics in Japan

Persons in charge: B. WADA—H. HARA

12:00-13:30 Reception by the President of University of Tokyo at Library of the University

14:00-17:00 **Sessions**

IA **Chromosome structure and mitosis**

Chairmen: K. DAN—A. LIMA-DE-FARIA  
E. WITSCHI—B. WADA

Sankei-kaikan, Tokyo  
Room 605

1. M. SHIGENAGA: On the structure of cell nuclei and chromosomes
2. G. YASUZUMI: Electron microscopy of chromosomes
3. H. RIS: A study of chromosomes with the electron microscope
4. H. MATSUURA: The mode of division of kinetochores at meiosis
5. A. LIMA-DE-FARIA: The four main chromosome regions with distinct cycles of division

Persons in charge: B. WADA—N. TANAKA

## IB Chemistry of chromosomes

Room 501

Chairmen: G. W. BEADLE—Y. NISHIWAKI  
J. HÄMMERLING—H. KIKKAWA

1. H. KIKKAWA, Z. OGITA and S. FUJITO: An inherent ability of metal-absorption in animals
2. M. OGAKI: Mechanism of manifestation in the bar-eyed mutant of *Drosophila melanogaster*
3. G. W. BEADLE: Recent advances in *Neurospora* genetics

Persons in charge: H. KIKKAWA—N. SHINKE

## IC Cytological aspects of cancer

Room 513

Chairmen: G. YERGANIAN—N. TANAKA  
W. E. HESTON—G. YASUZUMI

1. T. TANAKA and K. KANÔ: On the somatic chromosomes of rats
2. T. H. YOSIDA: Origin of V-shaped chromosomes occurring in tumor cells and their significance for tumor growth
3. S. MAKINO: The concept of stemline-cells as progenitors of a neoplastic population
4. G. K. MANNA: A study on chromosomes of the human nonneoplastic and neoplastic uterine tissues
5. L. SACHS: The chromosomal analysis of tumor behavior

Persons in charge: S. MAKINO—T. H. YOSIDA

## IIA Induced mutation

Room 525-526

Chairmen: G. L. STEBBINS—K. YAMASHITA  
R. F. KIMBALL—I. NISHIYAMA

1. Y. NISHIMURA: Genetic and cytological studies on the progeny of rice plants exposed to the atomic bomb as well as of those irradiated by X-rays
2. H. HASIMOTO: Translocation of a piece of an autosome to the W chromosome, and induction of a dominant lethal factor in the silkworm by X-rays
3. Y. NAKAO: Differences between male and female treatments in visible X-ray induced mutation rates in the silkworm
4. W. C. GREGORY: Radiosensitivity studies in peanuts (*Arachis hypogaea* L.)
5. K. YAMASHITA: X-ray induced mutations in einkorn wheats with special reference to their complex nature

Persons in charge: K. MURATI—Y. TAZIMA

## IIB Polyploidy

Room 502

Chairmen: O. J. EIGSTI—N. SHIMOTOMAI  
H. LI—R. URATA

1. S. MATSUMURA, A. MOCHIZUKI and S. SAKAMOTO: Triploid sugar beets and their seed production
  2. E. KNAPP: The significance of polyploidy in sugar beet breeding
  3. T. SIMURA: Breeding of polyploid varieties of the tea plant with special reference to their cold resistance
  4. O. J. EIGSTI: Analysis of triploids by use of the pollen tube method
- Persons in charge: S. MATSUMURA—S. NAGAO

**IIC Heterosis**

Room 515

Chairmen: T. KOMAI—R. P. LEVINE

J. B. S. HALDANE—D. MORIWAKI

1. H. SPURWAY: The relevance of heterosis to reproductive isolation
2. H. ONO: Intergeneric hybrid swarms in Cichorieae
3. D. MORIWAKI, M. OHNISHI and Y. NAKAJIMA: Analysis of heterosis in populations of *Drosophila ananassae*
4. Y. YAMASAKI, T. SUTÔ, and K. URANO: Cytological and serological aspect of heterosis in maize
5. J. W. BOYES: Somatic chromosomes of syrphid flies

Persons in charge D. MORIWAKI—Y. YAMASAKI

**IID Resistance**

Room 604

Chairmen: J. F. CROW—J. ASHIDA

C. C. LINDEGREN—A. YUASA

1. D. USHIBA, T. WATANABE, K. HASHIMOTO and Y. HSU: Genetic studies on streptomycin resistance in bacteria
2. T. AKIBA and T. YOKOTA: Inhibitory effect of sodium nitroprusside on the development of resistance of *E. coli* to streptomycin
3. Y. YAMASAKI: Drug resistance of rice blast fungus, *Piricularia oryzae* Br. et Cav.
4. J. ASHIDA: Copper resistance of yeast
5. J. E. MIDDLEKAUFF, S. HINO, S.-P. YANG, G. LINDEGREN and C. C. LINDEGREN: Gene control of resistance vs sensitivity to cadmium and actidione in *Saccharomyces*
6. A. A. IMSHENEZKI: Experimental variation in micro-organisms

Persons in charge: Y. YAMASAKI—N. HIRATSUKA

**IIE Polygenic inheritance**

Room 603

Chairmen: I. M. LERNER—K. SAKAI

E. ESSEN-MÖLLER—M. KIMURA

1. H. I. OKA: Change of population genotype due to gametic and zygotic selections in hybrids between distantly related varieties of rice
2. R. TAKAHASHI and S. YASUDA: Genetic studies of time of heading in barley
3. C. R. BURNHAM: The use of chromosomal interchanges to test for the independence of linkage groups established genetically
4. K. I. SAKAI: Theoretical studies on plant breeding techniques with special regard to autogamous plants
5. R. E. COMSTOCK and H. F. ROBINSON: Findings relative to reciprocal recurrent selection

Persons in charge: K. I. SAKAI—H. I. OKA

**IIF Microorganisms and viruses**

Room 602

Chairmen: S. BENZER—M. TSUJITA

F. RYAN—T. AKIBA

1. Y. TANAMI: Virus mutation and multiplication in host bacterial cell
2. H. FUKUMI: Fundamental considerations of the variation in host-range of bacterial viruses
3. S. BENZER: The elementary units of heredity
4. K. S. SUKHOV: The problem of hereditary variation of phytopathogenic viruses
5. S. INOKI: Origin of the akinetoplastic strain of *Trypanosoma gambiense*
6. M. TSUJITA and C. MATSUI: Lysogenic conversion of some genetic characters including sugar fermentation in *Pseudomonas solanacearum*

Persons in charge: M. TERADA—M. TSUJITA

**IIG Blood groups**

Room 601

Chairmen: O. F. von VERSCHUER—K. HUKUDA

T. E. REED—S. ISEKI

1. K. HUKUDA: On the limit of applicability of blood group ratio to determination of the racial origin of a population
2. T. E. REED: Tests of models representing selection in mother-child data on ABO blood groups
3. H. KOBAYASHI: On the blood groups of Ainu
4. J. M. BLUMBERG, L. H. MUSCHEL, E. OSAWA and D. A. McDERMOTT: Immune response to blood group A substance
5. T. FURUHATA and H. NAKAJIMA: Genetical investigations of secretor and non-secretor

Persons in charge: E. MATSUNAGA—H. NAKAJIMA

18:00-19:00 Reception by the President of the Science Council of Japan and the Chairman of the Organizing Committee at Hosigaoka-saryô

**7 September, Friday****9:00-12:00 Special lectures**

International Conference Hall, Sankei-kaikan

Chairmen: φ. WINGE—M. TERADA

- M. DEMEREC: Structure and arrangement of gene loci
- C. C. LINDEGREN, D. D. PITTMAN and B. RANGANATHAN: Orderly degradation of the MZ locus by ultraviolet radiation and its regeneration by contact with substrate
- J. HÄMMERLING: Proteinsynthesis, nuclear growth and activity; their control by energy production; their relation to morphogenesis
- I. E. GLUSHCHENKO: The phenomenon of polyfertilization in plants

Persons in charge: S. NAGAO—A. YUASA

**14:00-17:00 Sessions**

Sankei-kaikan

**IA Chromosome structure and mitosis**

Room 605

Chairmen: H. RIS—M. KODANI

M. MOTA—H. MATSUURA

1. K. SHIMAKURA: The chromosome movements during the spindle formation as observed in the living spermatocytes of some grasshoppers
2. M. MOTA: A new hypothesis of the anaphase movement  
B. WADA: Atractoplasm
4. M. KODANI: The karyotype of man with the diploid chromosome number of 48
5. E. WITSCHI: Genic and morphologic structure of sex chromosomes  
Persons in charge: B. WADA—N. TANAKA

**IB Chemistry of chromosomes**

Room 501

Chairmen: C. H. WADDINGTON—N. SHINKE  
G. S. STENT—A. SHIBATANI

1. H. NAORA: Studies on the deoxypentose nucleic acid content in nuclei of rat tissues
2. A. SHIBATANI, H. K. KIHARA and M. AMANO: Maintenance and replication of deoxypentose-nucleic acid in living cells
3. N. SHINKE, M. R. ISHIDA and K. UEDA: A study of the Feulgen reaction of plant cells
4. C. H. WADDINGTON: The role of nuclear structures in the incorporation of amino acids into proteins

Persons in charge: H. KIKAWA—N. SHINKE

**IC Cytological aspects of cancer**

Room 513

Chairmen: S. MAKINO—G. K. MANNA  
L. SACHS—T. TANAKA

1. F. WATANABE: Observation of the venereal tumor of dogs through fluid infection
2. T. KANEHISA: Cyto-histological study of the tumor in *Drosophila virilis*
3. Y. HAMAZAKI: Experimental induction of cancer by subcellular agents after feeding transplantable tumors
4. N. TANAKA and A. SUGIMURA: The effect of azaserine on mitotic cells of *Tradescantia paludosa*, with special reference to restoration of and protection against the damage caused by azaserine
5. G. Yerganian: Action of triethylene melamine on tumor chromosomes of the Chinese hamster, *Cricetulus griseus*

Persons in charge: S. MAKINO—T. H. YOSIDA

**IIA Induced mutation**

Room 525-526

Chairmen: N. H. GILES—K. MURATI  
D. SCHWARTZ—Y. TAZIMA

1. Y. NISHIWAKI: Symbolic analysis of metabolic mutations and some discussion of the target theory
2. A. V. BEATTY: Chromosome aberrations and physiological effects of X radiation in *Tradescantia* microspores
3. Y. TAZIMA: Differences in sensitivity of germ-cells and chromosomes to radiation among some mutant strains of the silkworm
4. W. K. BAKER: Consequences of radiation-induced chromosome breakage in *Drosophila* sperm
5. R. F. KIMBALL: Modification of genetic effects of X rays by treatment after irradiation



6. K. MURATI, T. ITO, D. MORIWAKI and Y. H. YOSHIDA: After effects of irradiation of the germ cells in *Drosophila melanogaster*
7. D. SCHWARTZ and C. B. MURRAY: A cytological study of breakage-fusion-bridge cycles in maize endosperm

Persons in charge: K. MURATI—Y. TAZIMA

## IIB Polyploidy

Room 502

Chairmen: E. KNAPP—S. NAGAO

E. R. SEARS—S. MATSUMURA

1. M. YAMASAKI and T. GOTOH: The resistance of polyploid plants to the toxic action of potassium chlorate and its significance for plant breeding
2. I. HIRAYOSHI: The chromosomal relationships in *Oryzae* and *Zizanieae*
3. H. W. LI and K. C. SHANG: Cytological studies of sugarcane and its relatives. XIV. Abnormal meiotic divisions in POJ 2725 and corn hybrid
4. B. C. JENKINS: A systematic substitution of rye chromosomes in winter wheat
5. I. NISHIYAMA: Cytogenetic studies in *Avena*, VII. Mutations in the progeny of triploid *Avena* hybrids

Persons in charge: S. MATSUMURA—S. NAGAO

## IIC Heterosis

Room 515

Chairmen: C. JUCCI—T. YOKOYAMA

J. W. BOYES—K. MASUI

1. K. MASUI and K. KONDO: The effect of female sex hormone on sexual differentiation of gonad of male chick embryo, with special reference to its difference by breeds and strains
2. C. HARADA: On the relation between commercial characters of parents and their  $F_1$  hybrids in the *Bombyx*-silkworm
3. A. G. SEARLE: Delayed hybrid vigour in mammals
4. T. HIRIBE: An analysis of heterosis, made with the silkworm
5. B. O. PHINNEY and C. A. WEST: The growth response of single gene dwarf mutants of *Zea mays* to gibberellins and to gibberellin-like substances
6. C. JUCCI: Heterosis and resistance
7. M. VETUKHIV: Heterosis in hybrids between local populations of *Drosophila pseudoobscura*

Persons in charge: D. MORIWAKI—Y. YAMASAKI

## IID Resistance

Room 604

Chairmen: B. P. PAL—N. HIRATSUKA

M. T. JENKINS—H. ARUGA

1. M. T. JENKINS, A. L. ROBERT and W. R. FINDLEY, Jr.: Genetic studies of resistance to *Helminthosporium turcicum* in maize by means of chromosomal translocations
2. M. TSUKAMOTO, M. OGAKI and H. KIKKAWA: Genetical analysis of resistance to insecticides in *Drosophila melanogaster*
3. C. OSHIMA: Studies on DDT-resistance of *Drosophila melanogaster* from the view point of population genetics

4. J. F. CROW: Genetics of DDT resistance in *Drosophila*
5. J. W. GOWEN and J. STADLER: The totipotency of all cells for typhoid resistance *Salmonella typhimurium* in mice
6. B. P. PAL and S. M. SIKKA: Breeding crop varieties resistant to diseases and pests in India

Persons in charge: Y. YAMASAKI—N. HIRATSUKA

## IIE Polygenic inheritance

Room 603

Chairmen: R. E. CO-STOCK—H. I. OKA

J. M. CAPINPIN—R. TAKAHASI

1. M. NEI: The analysis of covariation by a diallel cross
2. M. KIMURA: The rate of change of population fitness by natural selection
3. E. ESSEN-MÖLLER: The registration of familial relations in an unselected population
4. S. MOROHOSHI: Gene-controlled mechanism of the internal secretions concerned with the growth and development of the silkworm
5. G. TEISSIER: Discriminative biometrical characters in French and Japanese *Drosophila melanogaster*
6. CHUNG-FU CHENG: Dosage effect as expressed in the inheritance of starch grains in the internodal parenchyma cells of stem in sugarcane hybrids

Persons in charge: K. I. SAKAI—H. I. OKA

## IIF Microorganisms and viruses

Room 602

Chairmen: D. M. BONNER—Y. IKEDA

H. H. PLOUGH—K. SAKAGUCHI

1. B. S. STRAUSS: Reaction imbalance caused by a genetic lesion in carbon dioxide fixation in *Neurospora crassa*
2. L. GARNJOBST and J. F. WILSON: Heterocaryosis and protoplasmic incompatibility in *Neurospora crassa*
3. Y. IKEDA, C. ISHITANI and K. NAKAMURA: A high frequency of heterozygous diploids and somatic recombination induced in imperfect fungi by ultraviolet light
4. F. J. RYAN: Mutation in non-dividing bacteria
5. N. H. GILES, C. W. H. PARTRIDGE and N. J. NELSON: Genetic control of adenylosuccinase in *Neurospora crassa*
6. G. S. STENT: The distribution of the parental DNA among bacteriophage progeny

Persons in charge: M. TERADA—M. TSUJITA

## IIG Blood groups

Room 601

Chairmen: W. C. BOYD—S. UENO

J. M. BLUMBERG—H. MASAMUNE

1. H. MASAMUNE: Configuration of natural group substances within ABO classification and synthesis of corresponding artificial substances
2. T. YAMAKAWA, M. MATSUMOTO, S. SUZUKI and T. IIDA: Red cells glycolipid as ABO blood group antigen
3. W. C. BOYD: Blood groups and race
4. M. UETAKE and M. YOKOYAMA: The frequency of the Rh-Hr blood types in Japanese
5. S. UENO: On the ABO-subgroup of Japanese and hybrid children in Japan

Persons in charge: K. TANAKA—M. OKAJIMA

18:00-19:30 Reception by the Director of the International Cooperation Bureau,  
Ministry of Foreign Affairs at the International House of Japan

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18:30-21:00 Informal meeting on standardization of genetic nomenclature and  
symbols at the International House of Japan

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### 8 September, Saturday

9:00-12:30 **Special lectures** International Conference Hall, Sankei-kaikan

Chairmen: R. E. CLELAND—T. KOMAI

J. V. NEEL and W. J. SCHULL: Studies on the potential genetic effects of  
the atomic bombs

C. STERN: The role of genes in differentiation

R. TURPIN, J. LEJEUNE and M. O. RÉTHORÉ: Studies of the offspring of parents  
treated by pelvic radio-therapy

A. MÜNTZING: Cytogenetic studies in ryewheat (*Triticale*)

Persons in charge: S. MAKINO—A. YUASA

14:00-17:00 **Exhibits** Persons in charge: Y. NOGUTI—T. MATSUO

Silkworm: Sericultural Experiment Station

Persons in charge: T. YOKOYAMA—S. SHIMIZU

Long-tailed fowl: Ueno Zoological Garden

Persons in charge: K. MASUI—K. KONDO

Old documents: Library, University of Tokyo

Persons in charge: Y. SINOTÔ—N. TANAKA

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17:30-18:30 Reception by the Minister of Education at the Official Residence of  
the Prime Minister

19:00-21:45 Visit to Kabuki at the Meijiza Theater

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### 9 September, Sunday

8:00-20:00 Excursion to Nikkô

19:00-20:45 KARAKORAM—Documentary film: Kyôsei-kaikan

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### 10 September, Monday

9:00-12:00 **Joint sessions**

Sankei-kaikan

IA, B and C

Room 502

Chairmen: C. H. WADDINGTON—K. NAKAMURA

M. J. SIRKS—T. SHIMAMURA

1. K. DAN: SH-protein and the cell aster

2. W. E. HESTON: Effects of genes located on chromosomes III, V, VII, IX and XIV on the occurrence of pulmonary tumors in the mouse
  3. Films:
    - B. WADA and T. NITSU: Chromosome bridges —A motion picture—
    - K. SHIMAKURA: Studies on the mechanism of mitosis —A motion picture—
    - S. MAKINO, H. NAKAHARA and Y. H. NAKANISHI: Behavior of the mitochondria in relation to cytoplasmic division in grasshopper spermatocytes —A motion picture—
    - S. MAKINO and Y. H. NAKANISHI: Tumor cells —A motion picture—
- Persons in charge: T. TANAKA—H. KIKAWA

## IIA and B

Room 501

Chairmen: A. MÜNTZING—T. MORINAGA  
C. STERN—M. KOGURE

1. J. KUSPIRA and J. UNRAU: Genetic analysis of certain characters in common wheat using the whole chromosome substitution method
2. E. R. SEARS and M. OKAMOTO: Genetic and structural relationships of non-homologous chromosomes in wheat
3. K. YAMASHITA, H. KIHARA, I. NISHIYAMA, S. MATSUMURA and K. MATSUMOTO: Polyploidy breeding in Japan
4. G. L. STEBBINS: The hybrid origin of microspecies in the *Elymus glaucus* complex

Persons in charge: Y. TAZIMA—S. NAGAO

## IIC and E

Room 525-526

Chairmen: M. M. RHOADES—T. MATSUO  
G. H. SPRAGUE—Y. NOGUTI

1. T. YOKOYAMA: On the application of heterosis in Japanese sericulture
2. I. M. LERNER: Resistance of populations to change
3. G. F. SPRAGUE and W. A. RUSSELL: Some evidence on type of gene action involved in yield heterosis in maize
4. A. B. BURDICK: Constant parent regression analysis for studies of gene action in heterosis
5. T. KOMAI: Genetic basis of polymorphism
6. H. F. KUSHNER: The influence of metabolic factors on the heredity of animals

Persons in charge: D. MORIWAKI—K. I. SAKAI

## IID, F and G

International Conference Hall, Sankei-kaikan

Chairmen: M. DEMEREC—Y. YAMASAKI  
T. FURUHATA—N. H. HOROWITZ

1. H. UETAKE: Lysogenic conversion in bacterial antigens
2. S. ISEKI: Immunogenetic studies on some microorganisms
3. M. TERADA: Genetic studies on bacterial viruses
4. H. H. PLOUGH, M. R. ROBERTS, R. C-Y. TING and M. J. PATON: Transduction with a new bacteriophage in *Salmonella*—further evidence that transduction is crossingover
5. N. H. HOROWITZ: The genetic modification of enzyme structure

6.  $\phi$ . WINGE: The inheritance of fermentative ability in yeasts through complementary gene action

Persons in charge: N. HIRATSUKA—M. TSUJITA

- 13:00 Leave Sankei-kaikan for Hakone (by motor-coach)  
 14:30–15:00 Kihara Institute for Biological Research, Yokohama  
 16:00–16:50 Hiratuka Branch, National Institute of Agricultural Sciences  
 (Exhibit of the rice)  
 18:15 Arrive at Fujiya Hotel, Hakone

### 11 September, Tuesday

- 8:30 Leave Fujiya Hotel  
 9:00–9:30 Lake Asinoko  
 10:30–12:45 National Institute of Genetics, Misima  
 (Exhibit of Japanese morning glory)  
 13:00–14:00 Reception by the Mayor of Misima City at Rakuzyuen  
 14:50 Leave Numazu (by train)  
 21:30 Arrive at Kyôto Station

### 12 September, Wednesday

- 9:00–12:00 **Exhibits** The Municipal Art Gallery of Kyôto  
     Wheat: Person in charge: K. YAMASHITA  
     Radish: Person in charge: I. NISHIYAMA  
     Gold-fish: Person in charge: K. MATSUI  
 12:00–13:00 Reception by the President of Kyoto University at Miyako Hotel  
 14:00–16:00 **Closing session** Yasaka-kaikan, Kyôto  
     **Special lectures:**  
         Chairmen: H. NACHTSHEIM—M. DEMEREC  
     O. Frhr. von VERSCHUER: Tuberculosis and cancer in twins  
     J. B. S. HALDANE: Methods for the detection and enumeration of mutations  
         produced by radiation in mice  
     R. E. CLELAND: Chromosome structure in *Oenothera* and its effect on the  
         evolution of the genus

—Interval 10 minutes—

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|---|---|
| Address   | Dr. M. DEMEREC<br>Representing foreign participants                                 |
| Announcement on the 10th<br>International Congress<br>of Genetics | Dr. J. W. BOYES<br>General Secretary, 10th Intern.<br>Congress of Genetics          |
| Closing address   | Dr. Yosito SINOTÔ<br>Secretary, Organizing Committee<br>Person in charge: N. SHINKE |

# Opening Address

Hitoshi Kihara

Chairman, Organizing Committee, Science Council of Japan

Your Excellencies

Honorable Guests

Ladies and Gentlemen

On behalf of the Organizing Committee of the International Genetics Symposia, 1956, I want to express my deep gratitude to all the guests and participants for attending this meeting. Especially I wish to welcome all of you who have come a long way from other countries to join us here.

First of all, let me say a few words about how the present Symposia have come to be held in this country. At the 11th General Assembly of the International Union of Biological Sciences held in Nice in 1953 it was agreed that an international symposium in the field of genetics should be organized in Japan, and this was confirmed at the 9th International Genetics Congress in Bellagio.

The Science Council of Japan thereupon decided, with the approval of the Government, to organize an International Genetics Symposium.

The Organizing Committee first sought opinions of geneticists of various countries about the agenda of the Symposium. The opinions received, however, were widely divergent, and it seemed necessary to divide the meeting into two sections, the first section being a symposium sponsored by IUBS, on physical and chemical approaches to problems in chromosomes, the second section being another symposium dedicated to applied genetics organized by the Science Council of Japan.

Since a symposium originally is a meeting of a limited number of specialists, we subdivided the two sections into smaller sessions. In this way we have made our best to satisfy not only participants from Western countries but also those from Japan and other countries in the Far East.

This was the only solution we could find, considering that this event is to be one of the rare occasions we have in this region far away from Western countries.

Thus the Symposia have been divided into ten sessions and papers covering some of the topics in the agenda are to be given as special lectures at plenary sessions or to be read at joint-sessions in order to enable many persons belonging to different sessions to hear them.

As for the official language of the Symposia the Organizing Committee decided to use English after deliberate consideration. It was thought to be generally spoken and understood and therefore it was chosen as the official language.

As an event to be held as part of the Symposia we have for visitors from distant countries exhibits of materials studied mainly in Japan as well as plants and animals rare in other countries. Among the animals, silkworm, long-tailed fowl and goldfish, and among the plants, rice, wheat, radish and Japanese morning glory were chosen. Further, old Japanese documents of biological interest will be shown.

The invitations were extended to about one thousand geneticists in 64 countries and we are happy to welcome approximately one hundred foreign participants from nineteen countries.

On the occasion of the Symposia an informal meeting on standardization of genetic nomenclature and symbols will be held in order to exchange opinions on September 7. The draft of the rules is included in the material handed to the participants and frank opinions are desired by Dr. Yoshimaro Tanaka, Chairman of our Sub-committee.

For the preparation of our Symposia we have received kind assistance from IUBS, the Permanent International Committee of the International Congress of Genetics and many other organizations and individuals. Moreover, contributions for transportation of geneticists and for publication came from various quarters in the United States. I wish to express my heartfelt thanks to all sponsors and supporters both within and outside Japan, as well as to the authorities of other countries for their cooperation in our Symposia.

We have tried to be as careful as we could in our preparations. I hope that inspite of difficulties, arising from differences in language and manners, there will prevail mutual understanding and friendship among all the participants.

Herewith, I declare the opening of the Symposia with the fervent hope that they will be a great success.

Thank you..

## Welcome Address

Seiji Kaya

President, Science Council of Japan, Tokyo, Japan

Your Excellencies  
Honourable Guests  
Ladies and Gentlemen

On behalf of the Science Council of Japan and of all scientific circles in Japan, I join with you all in celebrating the opening of the International Genetics Symposia.

I especially desire to express my hearty welcome and deep gratitude to the approximately one hundred eminent scholars who have come a long way from different parts of the world to participate in our symposia.

As I understand, various important items in basic and applied genetics are expected to be discussed from to-day to the 12th of this month, and I firmly believe that, as the outcome of the earnest discussions based upon their many years' accumulated knowledge and recent studies, it will no doubt bring an epoch-making contribution to the progress of this important field of biological sciences.

I also expect that, through personal contact among the participants from different countries on this occasion of the symposia, international scientific co-operation and mutual understanding among scientists of the world will be enhanced, thus contributing to the gradual annihilation of the existing barriers between the countries of the world.

The Science Council of Japan organized an International Conference on Theoretical Physics in 1953, and an International Symposium on Algebraic Number Theory in 1955. I may take this opportunity of saying that greater results were achieved at each of these meetings than we had expected beforehand with regard to the above mentioned point.

I sincerely hope and believe that, the present symposia will achieve an even greater success with the mutual collaboration of all the participants. Finally I desire to add that, our foreign guests will be able, during their stay in Japan, to have enough leisure time to see various things in this oriental country so as to get full understanding of Japan in her past and present.

Thank you.



# Words of Welcome to Foreign Participants

Taku Komai

National Institute of Genetics, Misima, Japan

Ladies and gentlemen

It is a great honor for me to speak on this occasion, on behalf of the geneticists of Japan, words of welcome to the foreign participants at these symposia.

The Japanese geneticists are a fairly large group, as shown by the size of this assembly, and also by the number of members of The Genetics Society of Japan, which is over one thousand. The majority of these people are research workers in various branches of genetics. They are endeavoring to be loyal to their duties under the pressure of many handicaps. One of these handicaps is the great distance of our country from other countries where this science is most thriving. Thus except for a fortunate few, Japanese geneticists are not given a chance to travel abroad, to attend scientific meetings held there, to meet their foreign colleagues in person, and to discuss with them problems interesting to both parties.

Genetics in Japan has a long history, nearly as long as the history of genetics in any other country. In its past fifty years it has developed along its own course, so to speak, and has acquired a fairly distinct local color. Discoveries were made which might interest foreign investigators, but which have remained unknown or imperfectly known to them mainly by the barrier of language.

It is obvious that all these circumstances are rather unfortunate, not only for Japanese geneticists, but also for the geneticists of other countries. So we have desired for many years that an international meeting of geneticists be held in this country. Very fortunately, thanks to the thoughtful decision of the authorities of the International Union of Biological Sciences, and also of the Science Council of Japan, the chance has come. The government and general public of Japan have shown deep interest in this project. No less enthusiastic was the cooperation of governments and scientific associations of other countries. We are very grateful to the executives of these bodies in Japan and other countries for their moral support and financial aid to these symposia.

Above all, we most highly appreciate the deep interest and generous cooperation of you who are actually present here as participants. You have come long distances, in spite of various difficulties and obstacles, and all of you are ready to read papers and to join discussions in various sessions of the symposia. Some are willing to give special lectures or public lectures.