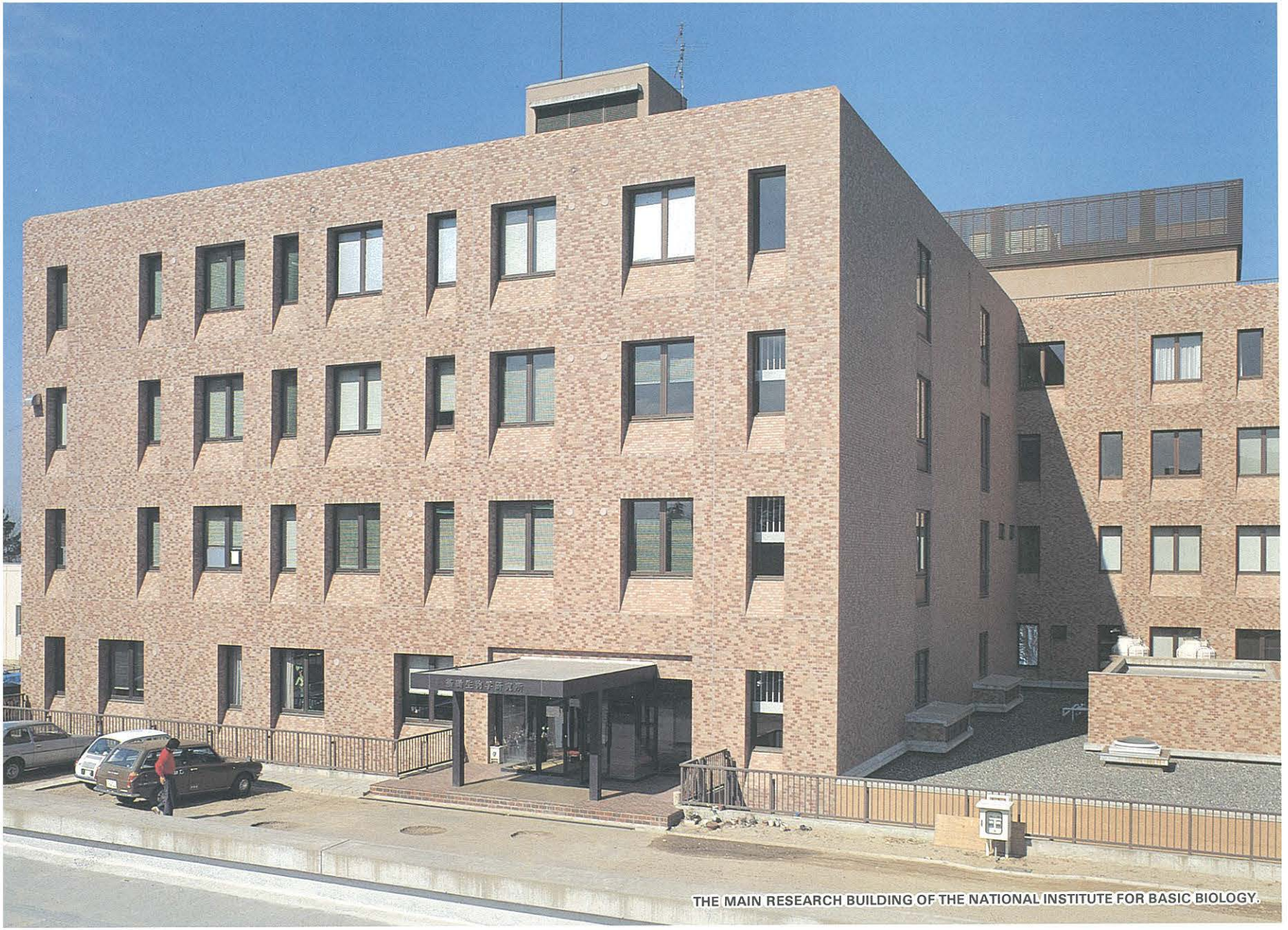
NATIONAL INSTITUTE FOR BASIC BIOLOGY

基 礎 生 物 学 研 究 所　岡崎国立共同研究機構

1982



THE MAIN RESEARCH BUILDING OF THE NATIONAL INSTITUTE FOR BASIC BIOLOGY.

BRIEF SUMMARY

The National Institute for Basic Biology, NIBB, is a part of a newly-established research organization, the Okazaki National Research Institutes located on a hill overlooking the old town of Okazaki. The research institute is composed of three independent organizations, National Institute for Basic Biology, National Institute for Physiological Sciences and Institute for Molecular Science.

NIBB is an interuniversity research institute with its own intramural research programs as well as cooperative programs to promote basic biology in Japan. The programs are 1) joint research programs in which university scientists are invited to participate in research projects with the intramural members, 2) facility-sharing programs in which university scientists utilize the institute's research resources, 3) graduate student training programs in which graduate students from universities spend fixed periods of time with the NIBB, and 4) international programs in which foreign scientists are invited to NIBB to conduct research projects.

DR. MASUTARO KUWABARA

INTRODUCTION

The National Institute for Basic Biology (NIBB) aims to provide solid basis for the biological sciences in Japan by promoting research activity on the fundamental mechanisms of life phenomena. Research areas include control mechanisms in reproduction, cell division and differentiation, biological rhythms, photobiology and vision physiology. Analytical approaches range from the molecular to organismic levels of organization.

For many years there has been a serious desire, among Japanese biologists, to have a national research center for biology. The desire materialized in May 1977 when Diet passed a bill to authorize the NIBB in Okazaki, a city close to Nagoya in the center of the Japanese archipelago. At the same time, a sister institute, the National Institute of Physiological Sciences, also a long-awaited, was approved. The two institutes collaborate closely, sharing many important facilites but keeping their own identity.

The NIBB, which is an interuniversity research institute and is still under development, has a two-fold mission: to conduct intramural and cooperative research. The former mission is discharged by the 13 divisions organized into three departments, the Departments of Cell Biology, Developmental Biology, and Biological Regulation. Each division has a full professor and an associate professor and two research associates. Of the 13 divisions, 5 are for adjunct professorships with joint appointment with other institutes in Japan. For the latter mission, the NIBB sponsors joint research programs with participating individuals or research groups throughout Japan.

The NIBB provides research resources to be shared among biologists in Japan as well from abroad. The NIBB sponsors symposia on interdisciplinary and unique research topics by inviting leading scientists from related fields both from within and outside Japan. Thus the NIBB promotes national as well as international scientific advances and exchanges in biology.

桑原万寿太郎

Masutaro Kuwabara, D.Sci.
Director General
National Institute for Basic Biology.

ORGANIZATION OF THE INSTITUTE

Policy and Decision Making

The Director General oversees the operation of the institute assisted by two advisory bodies, the Advisory Council and Steering Council. The Advisory Council is made up of distinguished scholars representing various fields of science and culture and advises the Director General on the basic policy of the institute. The Steering Council is made up of professors of the institute and an equal number of professors from other leading universities in Japan and advises the Director General on the scientific activities, intramural as well as extramural, of the institute. The Council advises on faculty appointments and on the institute's annual budget.

Administration

Administration of the institute is undertaken by the Administration Bureau of the Okazaki National Research Institutes under the direct auspices of the Ministry of Education, Science and Culture. Currently the chief administration officer is Mr. Hiroaki Mizumura.

Research

The institute conducts its intramural research programs through three departments organized into 13 divisions. Each division has its own research project and is staffed by a professor, an associate professor and two research associates with two research technicians. A division forms a project team and is expected to be reorganized when a division's project is completed. Half of the divisions are for adjunct professorship and are under professors who hold joint appointment with other universities. The adjunct division has resident research associates and technicians. The arrangement aims to facilitate exchange of research activities in Japan.

Technical Department manages the activities of research technicians and help to maintain the research resources of the institute. The department undertakes the technical education of its staff.

Research Support Facility

The intramural research support facility of NIBB includes the Large-scale Spectrograph Laboratory, Tisue and Cell Culture laboratory, Computer Facility, Plant Culture Laboratory, and Experimental Farm. In addition, seven facilities are operated jointly with the National Institute of Physilogical Sciences; they include Radioisotope Facility, Electron Microscope Facility, Center for Physical and Chemical Analysis, Central Shop, Glassware Cleaning Facility, Animal Care Facility, and Low-Temperature Facility.

Campus

The Okazaki National Research Institutes cover an area of 150,000 sq.m. with four principal buildings. The NIBB's main research building is expected to have a floor space of 10,930 sq.m. Currently two thirds of the planned space is completed and the remaing third is expected to be completed in the near future. The buildings to house research support facility are under construction or are being planned.

DEPARTMENT OF CELL BIOLOGY

Chairman : Haruo Kanatani (acting)
Secretary : Naoko Shimizu

The department is composed of two divisions and three adjunct divisions and conducts basic research on the structure and function of cells at the molecular level.

Division of Cell Mechanisms

Professor :
Associate Professor : Tsuneyoshi Kuroiwa
Research Associate : Yasuaki Yoshimoto
Kazuo Ogawa
Technical Staff : Shigeyuki Kawano
Soichi Nakamura

The division conducts research at the molecular level on mechanisms of mitochondrial prolifereation, cytoplasmic streaming and their correlation using the plasmodium of *Physarum polycephalum* as a model system through physiological, morphological and biochemical approachs. The plasmodium of the multinucleate slime mold, *Physarum polycephalum*, offers unique advantages for the study of cytoplasmic streaming and mitochondrial divison because (a) it performs vigorous reciprocal cytoplasmic streaming: (b) mitochondrial division can be semi-synchronized under easily controlled conditions and (c) its mitochondria contain an electron-dense mitochondrial nucleus which is composed of a large amount of DNA, RNA, and proteins. One theme of research is the reconstruction of mitochondria and mitochondrial nuclei which retain their ability to divide. Another theme is the development of a detergent-extracted model of a plasmodium strand which maintains its oscillatory apparatus and behavior.

Division of Biological Energy Conversion

Professor : Yoshihiko Fujita
Associate Professor :
Research Associate : Mamoru Mimuro
Technical Staff : Akio Murakami

The mechanism of biological energy conversion in photosynthesis has been investigated especially in the primary process, from light-capturing in photosynthetic pigments to photochemistry in the reaction center. The molecular architecture of the energy flow mechanism in the pigment system of blue-green algae are the focus in the former, and the molecular architecture of the photosynthetic reaction center I, especially of the primary electron acceptor system, is the present target in the latter. Electron flow between the two photosystems has been also investigated with special reference to the role of plastoquinone.

Division of Cell Fusion (Adjunct)

Professor : Yoshio Okada
Associate Professor : Tsuyoshi Uchida
Research Associate : Masahiro Ishiura
Kenji Kohno

Biology and genetics of cultured mammalian cells including human cells, utilizing cell engineering techniques based on cell fusion phenomenon by HVJ (Sendai virus) and microorganisms or their derivatives are proposed as the research projects for this Divison.

Division of Cellular Communication (Adjunct)

Professor : Yasutomi Nishizuka
Associate Professor : Yoshimi Takai
Research Associate : Kaoru Nishiyama

Cellular function and proliferation are frequently activated by interaction of extracellular messengers with specific cell surface receptors, and the mechanism of such activation, particular of transmission of information across the cell membrance has attracted great attention. The main project currently under way in this division is to explore the molecular basis of hormone actions as well as of other cell to cell communication. Along this line an entirely new receptor function has been recently uncovered. The function is independent of cyclic nucleotides but is directly coupled to phosphatidylinositol turnover provoked by various extracellular signals. Calcium, together with diglyceride derived from this phospholipid turnover, specifically activates a multifunctional protein kinase which plays roles of crucial importance for controlling a wide variety of cellular activities through protein phosphorylation.

Division of Cell Proliferation (Adjunct)

Professor : Yukio Hiramoto

The division conducts research on the mechanism of cell division and the cell cycle through physiological, biochemical and morphological approaches. Main projects are to explore mechanisms of the synthesis of proteins and nucleic acids at various stages of cell cycle, the formation of the mitotic apparatus, the movement of chromosomes and the cytokinesis.

DEPARTMENT OF DEVELOPMENTAL BIOLOGY

Chairman : Haruo Kanatani
Secretary : Junko Watanabe

The department is currently composed of two divisions and is expected to add one division and one adjunct division in the near future. The department conducts research into the cellular and molecular mechanisms of various processes which control developmental phenomena.

Division of Reproductive Biology

Professor : Haruo Kanatani
Associate Professor : Yoshitaka Nagahama
Research Associate : Hiroko Shirai
Takeo Kishimoto
Technical Staff : Hisayo Kondo
Shinji Adachi

The division conducts research into two major areas of the reproductive process: (1) the cellular and molecular mechanisms of formation and release of gametes, particularly the hormonal control of oocyte maturation and ovulation, and (2) mechanisms involved in fertilization. These studies combine biochemical, fine structural and physiological approaches.

Research centers around oocyte maturation in starfish. In this invertebrate species a hormonal substance, gonad-stimulating substance (GSS) secreted by the radial nerves, acts on the ovarian follicle cells to produce a second mediator of

maturation, maturation-inducing substance (MIS), 1-methyladenine (1-MeAde). 1-MeAde acts on the surface of the oocytes to induce formation of the third mediator of maturation within the oocytes, maturation-promoting factor (MPF) which brings about germinal vesicle breakdown. Current research is as follows: (1) the characterization and synthesis of GSS, (2) the mechanisms of biosynthesis of 1-MeAde in the ovarian follicle cells, (3) the isolation and identification of the 1-MeAde receptor located on the oocyte surface, (4) the characterization and function of MPF, and (5) fertilization in echinoderms: the role of divalent cations and jelly substances in the acrosome reaction.
In addition, the endocrine control of oocyte vitellogenesis and maturation in teleosts is under investigation. Particular attention has been given to (1) the purification of teleost gonadotropins, (2) the mechanism of gonadotropin action, (3) the identification of teleost MIS, and (4) the role of the different ovarian follicle layers in the production of estrogens and MIS.

Division of Cell Differentiation

Professor : Yoshiaki Suzuki
Associate Professor : Susumu Hirose
Research Associate : Masaaki Tsuda
Yoshihide Tsujimoto
Technical Staff : Etsuko Ishikawa
Satoko Takahata

The division conducts research on the molecular basis of cellular differentiation with a special emphasis on regulatory mechanisms of tissue-specific genes. The major target is fibroin and sericin genes which are expressed at specific stages of development in the posterior and middle portions of silk glands of the silkworm *Bombyx mori*, respectively. Employing the gene manipulation technology the members do "*in vitro* genetics"; isolation of target wild-type genes, preparation of desired mutant genes from the wild-type genes, and *in vivo* and/or *in vitro* tests of biological functions for the wild-type and mutant genes. They ultimately hope to understand the regulation machinery of the tissue-specific genes through a reconstructed system which reflects the states of *in vivo* regulation. For the study of *in vivo* tests of biological functions, improvements in the introduction of foreign DNAs into living cells, development of eukaryotic vectors, and cloning of mouse and human genomic thymidine kinase and other genes have been initiated in collaboration with members of the Tissue and Cell Culture Laboratory.

Division of Morphogenesis
(to be established)

Division of Developmental Biology
(Adjunct; to be established)

DEPARTMENT OF BIOLOGICAL REGULATION

Chairman : Yukito Oota
Secretary : Kiyomi Kawai

The department has two divisions and two adjunct divisions and conducts research on the information processing and control mechanisms in biological systems.

DATA TO DETERMINE THE PROMOTER REGION OF THE SILK FIBROIN GENE.

Division of Sensory Processing

Professor : Ken-ichi Naka
Associate Professor : Syozo Yasui
Research Associate : Hiroko Sakai
Eiki Hida
Technical Staff : Yuichiro Ando
Soh Hidaka

The division conducts research on the information processing in the visual system through an interdisciplinary approach which includes traditional morphology and physiology, as well as nonlinear (white- noise) analysis and modelling. The main thrust of research is the functional morphology of the retinal of channel catfish, *Ictalurus punctatus*, and identification of spatio-temporal filtering characteristics of retina neurons and neuron chains. The 14-year old research was originated at the Calif. Inst. Tech. and carried out at Univ. Texas Medical Branch at Galveston before it was moved to this new institute. The division is also planning to apply the methodology developed in channel catfish to study changes in the functional morphology of developing retinas.

Division of Chronobiology

Professor : Yukito Oota
Associate Professor : Hideaki Nakashima
Research Associate : Takao Kondo
Technical Staff : Yoko Fujimura

The division aims to clarify the molecular structure and physiological function of the endogenous circadian rhythms (biological clocks). At the moment, the genetic and biochemical analyses of the *Neurospora* clock which controls the conidiation rhythm and physiological and biochemical studies of the duckweed (*Lemna gibba* and *L. paucicostata*) clocks as related with the photoperiodic time measurement and also with the potassium uptake rhythm are the two major themes of research.

Division of Biological Regulation (Adjunct)

Professor : Masaki Furuya
Associate Professor : Yasuhiro Miyoshi
Research Associate : Kotaro Yamamoto
Satoru Tokutomi

The research in this division aims to study the regulatory mechanisms of biological functions at molecular and subcellular levels. The research programs proposed and being carried out at present center around the early changes induced by environmental stimuli: first, physical and chemical characterization of phytochrome, a photoreversible chromoprotein that mediates plant development; second, the primary action of photoreceptors regulating functions of biological membranes; third, identification of chemically unknown pigments such as the blue and near-ultraviolet light absorbing pigment that control several photobiological processes, a green light absorbing pigment controlling phototaxis, and others which have been, and will be indicated in the results obtained with the LARGE SPECTROGRAPH here.

Division of Behaviour and Neurobiology (Adjunct)

Professor : Keiichi Mimura
Associate Professor : Tateo Shimozawa
Research Associate : Teiichi Tanimura

The division conducts research on the invertebrate behaviour through neurobiological approach which includes electrophysiology, morphology, and behavioural and genetic analysis. The division attempts to progress our researches through the following three ways. First, insect vision, especially neuronal mechanisms of the fly visual system, are investigated by electrophysiological, morphological and behavioral methods. The second project intends to reveal the molecular mechanisms of taste in the fruit fly, *Drosophila melanogaster*, employing genetic methods. The approach includes electrophysiological and biochemical analyses of various mutants in sugar responses. The neural mechanisms underlying feeding behaviour is also a subject for study. Third, neuronal networks responsible for the generation of motor programs — e.g. righting behaviour, stridulation, and locomotion of crickets are interested. Particularly, analysis of the mechanisms involved in the selective recruitment of motorneurons is intended by means of microelectrodes, intracellular dye tracers and electron microscopy.

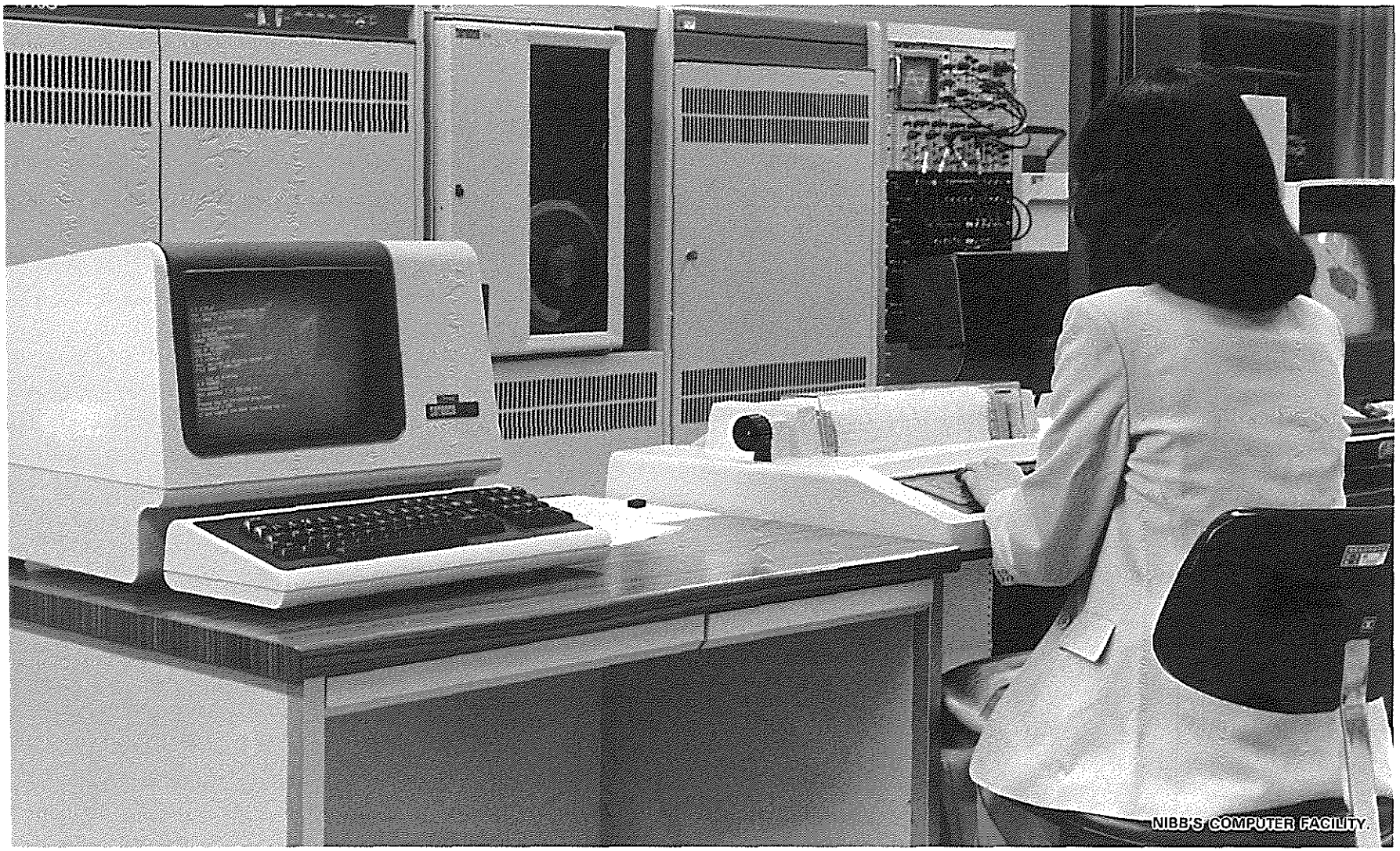
TECHNICAL DEPARTMENT

Chief : Hachiro Honda

The Technical Department is a supporting organization for researchers and research organizations within the NIBB. The department develops and promotes the institute's research activities and, at the same time, maintains the research functions of the institute.

The Department is organized into two groups: one, the Research Support group, which assists the intramural research activities and the other, the Common Facility group, which supports and maintains the institute's common research facilities.

Technicians participate, through the department, in promoting their capability through mutual enlightenment and education so that their capability in technical area develops.



NIBB'S COMPUTER FACILITY

RESEARCH RESOURCE

There are four categories of research support facilities available to the intramural as well as to the visiting biological scientists: 1) Campus-wide facilities (CENTRAL COMPUTING CENTER and LIBRARY), 2) NIBB's own research support facilities (RESEARCH SUPPORT FACILITY, intramural), 3) facilities jointly maintained by the NIPS and the NIBB but managed either by the NIPS (ANIMAL-CARE FACILITY) or by the NIBB (RADIOISOTOPE FACILITY), 4) facilities jointly run by NIPS and NIBB (CENTER for PHYSICAL and CHEMICAL ANALYSIS, ELECTRON MICROSCOPE FACILITY, WASHING ROOM, MACHINE SHOP and LOW-TEMPERATURE FACILITY).

RESEARCH SUPPORT FACILITY (INTRAMURAL)

Head of Facility : Ken-ichi Naka
Faculty : Masakatsu Watanabe (Spectrograph)
Yoshio Hamada (Tissue and Cell culture)
Technical Staff : Mamoru Kubota

The facility maintains large-scale experimental equipment and facilities for growing and maintaining biological specimens. The facility is shared by the intramural members and have five laboratories.

The Large-Scale Spectrograph Laboratory: This laboratory has the largest spectrograph in the world custom-built by Naka works, Hitachi Ltd. The spectrograph runs on a 30 KW-Xenon arc lamp and has a compound grating-surface composed of 36 smaller individual grating. A computer controls the positioning and time-scheduled light exposures of 12 specimen boxes.

Tissue and Cell Culture Laboratory: This is a facility for tissue and cell culture. This laboratory is equipped with safety rooms which satisfy the P3 physical containment level. This facility is routinely used for DNA recombination experiments.

Laboratory Computer Facility: The NIBB's computing is handled by a Digital Equipment Company's VAX 11/780 computer with a Floating Point System AP-120 array processor and a Spatial Data image digitizer. An extensive software system for time-series analysis is available as well as a limited number of image processing routines.

Plant Culture Facility: There are a large number of culture boxes and cubicles and a limited number of rooms with environmental control for plant culture.

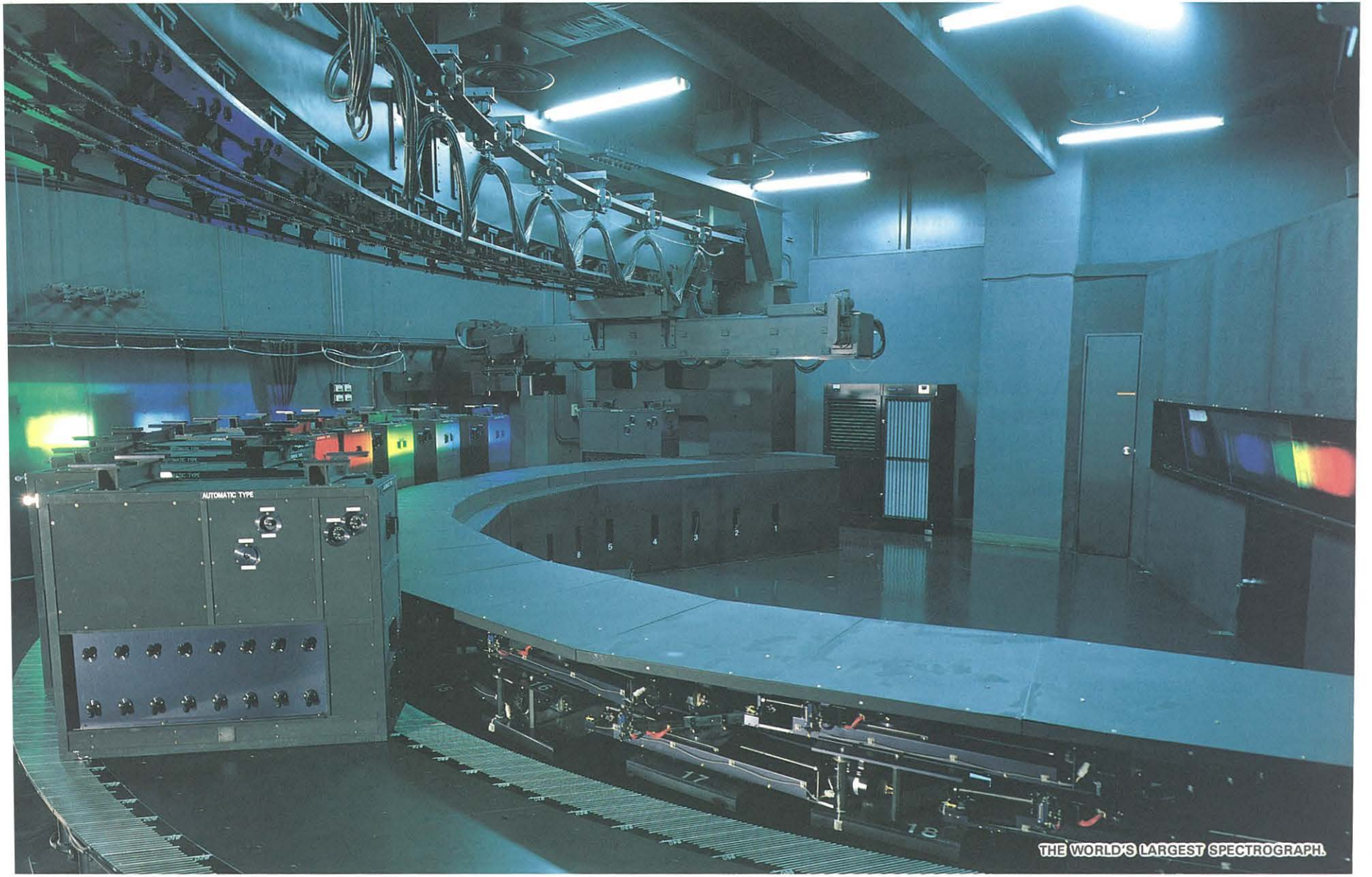
Experimental farm: Two 20 sq.m. glass-houses with precision temperature control are available. A limited farm facility is being planned.

RESEARCH FACILITIES

RADIOISOTOPE FACILITIES (managed by NIBB)

Head of Facility : Yoshiaki Suzuki
Faculty : Kohji Hasunuma
Technical Staff : Kazuhiko Furukawa
Yukie Shinohara

The facility is composed of a center and two subcenters, one in NIBB and other in NIPS. The facility is for molecular analyses of eukaryotes. At the center radioisotopes of higher activities such as ^{22}Na, ^{125}I, ^{32}P, ^{3}H and ^{14}C will be handled as well as various species of gamma-ray emitting


AUTOMATIC TYPE
THE WORLD'S LARGEST SPECTROGRAPH.

nucleides. At the substations, radioisotopes of lower activities such as ^{3}H, ^{14}C, and ^{32}P are processed. The substation in NIBB is equipped for P2-level DNA recombination research. The center will also be equipped for P3-level DNA recombination research. The members of the Radioisotope Facility maintain and control the centers, and give appropriate guidance for radioisotope handling.
The facility members conduct their own research on the analysis of meiosis in *Neurospora crassa* based on many isolated mutants with meiotic nondisjunction.
The goal of the research is to isolate the genes for the regulation of meiosis with DNA recombination techniques.

ANIMAL-CARE FACILITIES
(managed by NIPS)

Vivarium: This is a 2,000-sq.m. building for (admitting and maintaining) land animals, including insects. Operations and experiments of a limited scope may be performed in the vivarium.

Aquarium: This is a 600-sq.m. facility for both fresh- and sea-water animals. There are 10 ten-ton and 31 0.5-ton tanks in addition to one seven-ton and one two-ton circular tanks. All tanks are individually temperature controlled and are supplied either with deionized water or seawater. There is a lorry with a one-ton temperature-controlled tank to transport aquatic animals and plant.

RESEARCH FACILITIES RUN JOINTLY WITH THE NIPS

ELECTRON MICROSCOPE CENTER

Electron Microscopy Facility: This facility maintains the following microscopes for the use of intramural members as well as researchers from other universities and research institutions.
Transmission microscope: Hitachi H-500 125KV, JOEL 100-CX and 200-CX 100 and 200KV, and Philips EM-400HM 120KV.
Transmission scope, analytical: JOEL 200-CX, 200KV.
Scanning scope: Hitachi S-450 25KV.

CENTER FOR PHYSICAL AND CHEMICAL ANALYSIS

Head of Facility : Haruo Kanatani
Technical Staff
Unit Chief : Hiroyuki Hattori
Staff : Hiroko Kajiura

Center for Physical and Chemical Analysis: The Center for Physical and Chemical Analysis consists of the following five sections. (1) Chemical analysis, (2) Preparation of biological materials, (3) Spectroscopic analysis, (4) Physical analysis, and (5) Microscopic analysis. Each section is equipped with instruments for general use as listed below.

1. Section for Chemical Analysis

Amino Acid Analyzer	HITACHI 835
Peptide Sequence Analyzer	JEOL JAS-47K
Peptide Synthesizer	BECKMAN 990B
HPLC	JASCO TRI ROTAR III

Dual-wavelength TLC Scanner	SHIMADZU CS-910

2. Section for Preparation of Biological Materials

Preparative Ultracentrifuge	BECKMAN L8-80
Two Parameter Cell Sorter	BECTON-DICKINSON FACS-II
Coulter Counter	COULTER ZB

3. Section for Spectroscopic Analysis

Spectrophotometer	GILFORD 250
Spectrophotometer	HITACHI 330
Dual-wavelength. Spectrophotometer	HITACHI 557
Spectrofluorometer	HITACHI MPF-4
Infrared Spectrophotometer	JASCO A-302
Atomic Absorption Spectrophotometer	PERKIN-ELMER 603
Laser-Raman Spectrophotometer	JASCO R-800
Spectropolarimeter	JASCO J-40S
Light Scattering Photometer	CHROMATIX KMX-6DC

4. Section for Physical Analysis

Superconductive FT NMR Spectrometer	BRUKER WM 360 Wb
EPR Spectrometer	BRUKER ER 200D
GC Mass Spectrometer	HITACHI M-80
Quadrupole Mass Spectrometer	JEOL JMS-QH100
Analytical Ultracentrifuge	HITACHI 282
Viscometer	CONTRAVES RM-30
Differential Scanning Calorimeter	PERKIN-ELMER DSC-2

5. Section for Microscopic Analysis

Microscope Photometer	CARL ZEISS MPM 03-FL
Image Analyzer	KONTRON MOP-AM03
Image Analysis System	KONTRON IBAS-I.II
Microdensitometer	JOYCE LOEBL 3CS
Motion Analysis System	NAC MOVIAS GP-2000

COOPERATIVE RESEARCH ACTIVITIES

The NIBB sponsors four cooperative research activities.

Individual and group cooperative research program: Scientists from other Japanese universities and research institutes are invited to undertake joint research projects with the intramural members. Limited funds are available for travel and expenditures related to the projects.

Research conferences: The NIBB sponsors research conference on important subjects in biology. Ten to twenty scientists are invited and intense discussion is held for two to three days. The NIBB provides financial support for the participants. Conferences may be initiated by scientists with other institutes or by intramural members.

Facility-sharing program: Scientists with other universities are entitled to the use of specified instruments maintained by the NIBB. No financial support is available except for the Large Scale Spectrograph whose user is provided with limited financial support.

Graduate student programs: Graduate students with other universities may spend a fixed period of time with members of NIBB. This allows students to have experience with the very modern facility of NIBB. The NIBB, however, does not have its own graduate program.

LIBRARY

The three institutes of the Okazaki National Research Institutes share a common library facility. The library is a part of the main administration building and has a floor space of about 2,000 sq.m.

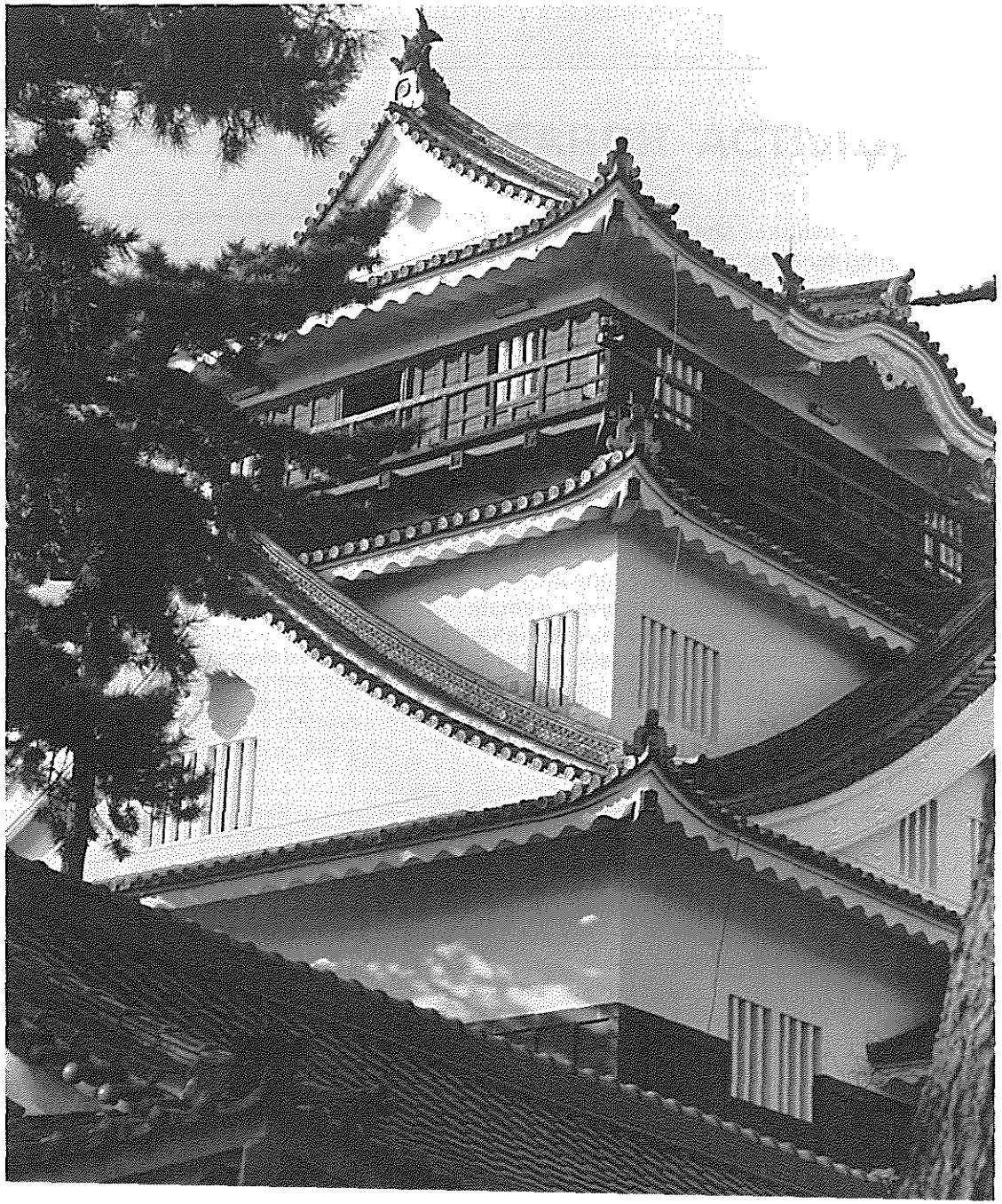
The library has a stock of 6,300 books in Japanese and 19,800 in foreign languages and subscribes to 226 Japanese and 385 foreign journals. Lending records, inventory, and literature searches are computerized. The library is open 24 hrs every day.

LODGING FACILITY

The Okazaki National Research Institutes maintain two lodging facilities, one Mishima Lodge and the other Yamate Lodge. Mishima Lodge is a few minute walk away; Yamate Lodge is less than 20 minutes. The lodges are for scientists and their families staying for fixed periods of time with the institutes. Some suites and bungalows are provided with kitchenette facilities. A modest charge is levied to help to maintain the facilities.

Mishima Lodge has 27 single rooms, 3 suites and 6 bungalows for large families. Yamate Lodge has 11 single rooms, 4 suites and 2 family complexes.

On the campus there is a dining facility which is open Monday through Saturday.



THE OKAZAKI CASTLE,
HOME OF THE FIRST
TOKUGAWA SHOGUN, IYEYASU.

THE CITY

The city of Okazaki, incorporated in 1916, is located 30 kilometers southwest of Nagoya, the fourth largest city in Japan. A high-speed urban train connects the two cities.

Okazaki, with a population of 267,000, is a typical medium-size city in Japan and offers the convenience of urban life while avoiding the disadvantages of a large city. Okazaki is the commercial as well as cultural center of the Mikawa (Three River) district with its rich historical heritage. Iyeyasu Tokugawa, the first Tokugawa Shogun, was born here in 1542 and built a castle here. The original parapets and moats and the rebuilt castle still dominate the city as they did 500 years ago. When he established the Shogunate in Edo (the former name of Tokyo) in 1603, Iyeyasu took a large contingent of Mikawa Bushi (Mikawa Samurai or professional warriors) with him. Those Mikawa Bushi formed the nucleus of Iyeyasu's new administration.

Within a radius of 10 kilometers from the city center are located Mitsubishi Motor's Okazaki Plant, Toyota Motor's main production facilities in Toyota City, and Sony's ultra-modern Koda plant which produces video tape recorders.

TRANSPORTATION

BY TRAIN

From Tokyo to Toyo-hashi: Two and half hrs by the Japan National Railway's (JNR) super train (KODAMA or ECHO). The train runs every 30 min.
From Toyo-hashi to Okazaki: Twenty five minutes by the Mei-tetsu (Nagoya Railway) express. Mei-tetsu's station in Okazaki is Higashi (or East) Okazaki. The train runs every 20 to 30 min. This is the most convenient route to come to Okazaki from Tokyo.

From Tokyo to Nagoya: Two hrs by the JNR's super train (HIKARI or LIGHTENING). The train runs every 30 min.
From Kyoto/Osaka to Nagoya: One to two hrs by the JNR's super train (HIKARI/KODAMA). Kin-tetsu (Kinki Nippon Railway) also serves between Osaka/Nara and Nagoya.
From Nagoya to Okazaki: Thirty five minutes by the Mei-tetsu express which runs every 20 min. Mei-tetsu's station in Okazaki is Higashi (or East) Okazaki.

BY AIR

Domestic airlines serve Komaki, Nagoya, airport which is 1 hr. drive from Okazaki.

WEATEHR

In Okazaki, temperature goes up to 30 degree centigrade in the summer and down to a few degrees above the freezing point in the winter. May to June is the rainy season and the spring (March to May) and fall (September to November) are most pleasant.

DIRECTOR GENERAL

MASUTARO KUWABARA, B. Sci. & D. Sci. (zoology, Hokkaido Imperial Univ.), Research Associate, Hokkaido Imperial Univ. (1933—43), Lecturer, Hokkaido Imperial Univ. (1943—44), Associate Professor, Hokkaido Imperial Univ. (1944—49), Professor, Kyushu Univ. (1949—73), Dean, Kyushu Univ. (1964—66), Professor, Sophia Univ. (1973—77), Director-General, NIBB (1977—), President, ONRI (1981—)

PROFESSORS

YOSHIHIKO FUJITA, Division of Biological Energy Conversion, B Sci., M. Sci. & D. Sci. (biochemistry, Univ. Tokyo), Research Associate, Inst Appl. Microbiol., Univ. Tokyo (1957—67), Postdoctral Fellow, Univ. Texas (1962—64), Research Associate, Univ. Texas (1965), Associate Professor, Ocean Res. Inst., Univ. Tokyo (1967—77), Professor, Ocean Res. Inst., Univ Tokyo (1977—), Professor, NIBB (1979—)

MASAKI FURUYA, Division of Biological Regulation, B. Sci. & D. Sci (botany, Univ Tokyo), Ph. D. (plant physiology, Yale Univ.), Research Associate, Yale Univ. (1962), Research Fellow, Harvard Univ. (1962—63), Assistant Plant Physiologist, Brookhaven National Lab (1963—65), Associate Professor, Nagoya Univ. (1965—68), Professor, Univ Tokyo (1969—), Adjunct Professor, NIBB (1980—)

YUKIO HIRAMOTO, Division of Cell Proliferation, B. Sci. & D. Sci (zoology, Univ. Tokyo), Research Associate, Zoological Institute, Univ Tokyo (1952—54), Lecturer, Zoological Institute, Univ Tokyo (1954—56), Associate Professor, Misaki Marine Biological Station, Univ. Tokyo (1956—71), Professor, Tokyo Institute of Technology (1971—), Adjunct Professor, NIBB (1981—)

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