AWARD OF MEDALS

The Seventy-first Annual Award of Medals was held on Wednesday, June 10, 1981, at 10:00 a.m., in the presence of His Majesty the Emperor.

The function was opened with an address by the President, in which he made a brief statement of each award. Then the Medals and Prizes were presented to the respective recipients.

After this, congratulatory addresses were given by the Prime Minister and the Minister of Education.

The function was closed at 11:20 a.m.

THE RECIPIENTS OF THE PRIZES AND THE SUBJECTS OF THEIR STUDIES

Yasuiti NAGANO

Studies on Interferon

The research accomplishments of Dr. Yasuiti Nagano on the phenomena of antiviral immunity and on interference in viral infection have been accorded world wide acclaim. Since 1940, he conducted a series of experiments to determine precisely the time when antiviral immunity appears in the organism. Rabbits were inoculated with vaccinia virus on multiple skin sites which were then vaccinated at various time intervals and observed for inhibition of skin lesions. The inoculum used for these tests was a combination of animal tissue components and inactivated virus prepared by ultraviolet irradiation of homogenates of rabbit tissue infected by vaccinia virus.

The onset of infection could be inhibited even by vaccination one day after virus inoculation. Furthermore, viral replication was inhibited as early as four hours after vaccination, when immune antibody was not yet detectable in the local tissue. Thus it was confirmed that a factor other than immunity was at work. This factor was found to be present in the centrifuged supernatant, but not in the virus particles of the vaccine, leading to the conclusion that the infected tissue contained a non-immune antiviral component (1954). This was the first report leading to proof of the existence of a substance later named interferon. Nagano then went on to prove that this factor was unrelated to immune antibody. In fact, there

are two peaks of vaccine efficacy, one appearing at one to two days and the other at two weeks after vaccination. The later peak was conventionally considered the immune effect, but the earlier peak was found to be a nonimmune effect (1957). The tissue supernatant showed only one peak of vaccine efficacy, that appearing one to two days after vaccination. The immune serum used as control showed maximum efficacy on the day of injection, proving that the factor in question was neither viral antigen nor antiviral antibody (1958).

The results of research of this factor are as follows: a) Chick interferon was ineffective in rabbits (1954) ; this was the first report of the species-dependency of interferon effect. b) Interferon was thought to have no antigenicity, but Nagano demonstrated for the first time that it has a weak antigenicity. This was subsequently used for the classification of interferon into different types. c) Macrophages extracted from an organism produced interferon without the help of an inducer. This was the first description of the "spontaneous production" of interferon. d) Interferon was found to be a type of uncoupler of oxidative phosphorylation whose site of action differed from that of previously known types. This property of interferon does not contribute to the mechanism of inhibition of viral replication. e) Virulent strains of tuberculosis bacteria incorporated into macrophages will replicate inside the macrophages, but interferon can inhibit this growth. f) Interferon inhibits the growth of tumor cells without the help of the host's macrophages or lymphocytes. This activity is cytostatic, but not cytocidal. g) Interferon stimulates myelogenous leukemia cells (myeloblasts) to differentiate, transforming themselves into cells almost identical to end function cells such as granulocytes and macrophages, and cease dividing. h) Interferon inducers such as double stranded RNA, bacterial endotoxin and myxovirus administered to the above leukemia cells induce the cells to produce interferon, to differentiate into phagocyte-like cells and to cease division and replication.

Yōichi MAÉDA

A Commentary on Pascal's 'Pensées', Volume I

This book is a part of harvest contains, however, most important core of long studies of Dr. Yōichi Maéda on Pascal's "Pensées". Three articles composing the second part of the book are just the core. They are all issued, at first, in French. The first one (enlarged

amply in this Japanese version) "Le premier jet du fragment pascalien sur les deux infinis" first published in "Études de Langue et Littérature Françaises" (Tokyo, 1964) was appreciated world-widely. Prof. Mesnard, one of the French leading "pascaliens", pointed out in the Chronology of Pascal Studies, joined as an appendix of his book, this item of 1964 as a phenomenon which ⟪renews the interpretation of variants of Pensées⟫. (Jean Mesnard: *Les Pensées de Pascal.* Paris, 1976)

Dr. Maéda succeeded to distinguish and reconstitute two stages of drafting fragments of *Pensée,* id est ⟪le premier jet⟫ with its immediate corrections and groups of corrections as well as additions written after a certain length of time as Pascal was used to do. It is Prof. Mesnard himself who named this method ⟪la double lecture⟫. This original method enables not only the author himself but also many other researchers of Japan and Europe to interpret the text not as a flat text but to consider it as a relief reflecting the original creative spirit of Pascal.

Fundamentally adapting the order of Lafuma's edition, Dr. Maéda attempts to establish a complete critical text with detailed and critical commentaries in several organizations of Humanistic scholars after about forty important editions published during the past three centuries. Each fargment is taken up in the following manner. (1) Photographic reproduction of the original manuscript. (2) Printed transcription reproducing the disposition and all significant details of the manuscript. Here at work his method ⟪double lecture⟫. (3) Transcription in current spelling. (4) Translation into Japanese. (5) Commentaries including several new concluding ideas.

This book is highly valued as a monument of the author's important contributions to the humanistic studies.

Makoto OGAWA

The Rise of the Kindred Shugos of Ashikaga Shogun

Among the branches of Ashikaga clan, the Hosokawa, Shiba and Hatakeyama families attained leading places to exert control over their *bunkoku* (domains assigned to *shugo*) as *shugo* for generations. And the head houses of these three families built up the most distinguished position to be chosen to *kanrei* in the political system established by *buke,* namely, that of shogunate and *shugo.*

The book in question consists of three parts which respectively

deal with the problems concerning the development of powers and positions of the above-mentioned three families.

The author made a close examination of the most thoroughly collected documents which had been issued, during the periods of *Nan-boku-cho* (South and North Imperial Courts) and early *Muromachi* (from the middle of 14C to the beginning of 15C), from *shogun, shitsuji* and *bakufu-bugyo* as well as from the said three families. Whereby the author put forward some new facts in regards to changes of *shugo,* courses of their *bunkoku* control and of actions of *shugodai* and *kokujin,* and tried to correct some of the accepted view through strict and precise critiques. Especially, the distinctive features of author's study can be observed in his careful approaches to and handling of the said documents, which he classified according to their contents and dates of issue, and thereby have thrown new light upon the questions when and what kinds of positions and powers were authorized to the three families.

In this way, the author, considering ranks and positions which these three families established in the Ashikaga clan, made a thorough study of activities which three families politically and military had performed in the current of history, ranging from the riots of *Genko* and *Kenmu,* through the foundation of the Ashikaga shogunate, the riot of *Kanno,* and the battle against *Nancho* (South Imperial Court), down to the reign of Ashikaga Yoshimitsu, and elucidated the fact that to what extent the three families, as *shugo,* had succeeded in exerting *bunkoku* control. Furthermore, the author examined the rights and duties of *shitsuji* and other shogunal officials and, explaining among others all the details, how the three families attained the post of *kanrei* to participate in the administration of Ashikaga shogunate, made every effort to elucidate the formation process of *kanrei* system and the details of its authority which have not yet been made clear, and also to clarify the distinction of rights and powers between those of *shogun* and *kanrei.* Thus the author made a great contribution to the study of the *Muromachi* shogunate system.

Akira KINOSHITA

The Surviving Serfdom: An Analysis of the *Nago* Labor System in Prewar Rural Japan

The surviving serfdom here refers to the archaic *nago* labor system, which was based on the lord-serf status relationship, going

back to the feudal age. This labor system was still observable in prewar Japan in the so-called Tohoku type of agriculture. The author elucidates in this work its history, its geographical distribution and its process of disintegration by means of an empirical research through an ample use of documents and a number of field surveys. The socio-economic significance of the *nago* system is also examined.

The work consists of the following three parts. The first offers a general outline, showing in detail its geographical distribution around 1935, and revealing a heavy concentration in Iwate Prefecture and surrounding areas as late as World War II. The tenacity with which the system survived as well as its ultimate dissolution is deemed highly significant in socio-economic terms.

The second part is made up of a typological analysis, where two types of *nago* are distinguished. One is the so-called *nago* by status, derived from the lord-retainer relationship of the feudal age, typified in the cases of the Iwamura and Toyomane families. The other is *nago* by debt, which gradually evolved as the money economy permeated the region. The Haruyama family, where this category of *nago* was most conspicuous, successfully accumulated wealth through the use of *nago* by debt and active investment in such varied areas as commerce, finance, agriculture, forestry, stock raising, iron works and salt manufacture, whose demesne even reminded the author of that of a *Junker* in Germany.

The third part analyzes the process of dissolution. Under the impact of emerging modern industry the conflict between lord and serf deepened, gradually disintegrating the still surviving *nago* labor system, until it was almost totally dissolved by the Land Reform following the end of World War II. The Haruyama family, however, successfully dealt with the changing environment due partly to diversified investment and even survived the Land Reform in economic terms. A detailed description of this particular case by the author with rich documentation forms the most interesting as well as valuable portion of the entire volume.

Mitsuo TOKORO

A study of the History of Forestry
in the Tokugawa Period

One of the distinctive features of the present volume, entitled "The History of Forestry in the Tokugawa Period", is to be observed

in the fact that it is a fruit obtained by a devoted scholar's 50 years' untiring study. With the said title as its theme, the author has carried out this excellent research work, by delving into the problems from various sides and also by making careful examinations of abundant historical materials concerning the history of forest and its administration, through focusing both periodically to the Tokugawa period, and regionally to some parts of Central Japan. However, it is not too much to say that the said volume has put one of the most undeveloped fields of economic history of Japan, namely, the history of forestry, to the first big plow.

As stated above, the greater part of this laborious work is wholly concerned with the history of forestry in the Tokugawa period, but the first chapter of introduction entitled "Forestry in the Pre-Tokugawa Period" which accounts for about ten percent of the whole, is assigned to the description of the history of forestry in Ancient and Middle Times. Needless to say, it is not this introductory chapter, but the other chapters, occupying the remaining 90 percent of the book, that make the principal part of his work.

The author limited the object of his study regionally to the three provinces of Shinano, Mino and Hida which were deemed to be most important for the study of history of forestry in the Tokugawa period, especially approaching problems concerning forestry system and administration and above all cultivation of timber forest. In particular, his attention was focused on Kiso timber forest in Owari Province.

It can be taken for granted to attribute the author's inclination for the historical study of forestry to his life's devotion of some 50 years of study, as one of the research workers and later as director of the Tokugawa Forestry Research Institute, founded by the late Mr. Yoshichika Tokugawa, the last adopted heir of the Tokugawa Feudal clan.

The chapters and sections which compose this book are as follows:

Chapter I	Forest Administration by the Tokugawa Shogunate
Section I	Demand and Supply of Timbers and Forest Administration by the Shogunate
Section II	Forestry by the Shogunate
Section III	Supply of Timbers urgently needed by the Shogunate—Timbers Needed for Reconstruction of Nishi-no-maru of the Castle of Edo
Chapter II	Forestry in the Private Feudal Domains
Section I	Forestry by the Matsumoto Clan
Section II	Forestry by the Matsushiro Clan
Section III	Forestry Dispute and its Judgement
Chapter III	Kiso Forestry by the Owari Clan

Section I History of Pre-Kiso Mountain Forestry
Section II Administration of Kiso Mountain Forestry
Section III Land Tax and Corvée in Kiso
Section IV Forest Policy of Feudal Clan
Section V Timber Production
Section VI Transportation of Timbers
Section VII Dealing of Produced Timbers

Under many chapters and sections, as shown above, and further providing many sub-sections under them, the author attempted to describe minute details to explain various problems of importance, making good use of ample relevant but unpublished historical materials. It can never be overlooked, however, that his keen attention is concentrated on the most important regions for a study of this kind, though regionally restricted as the table of contents shows, and that every possible effort has been made to elucidate, from the broadest perspective, all the problems relating to the said regions, such as, forestry system, system of taxation, cultivation and management of timber forest, dominum and usufructuary right of forest, forestry dispute, timber merchants, forest workmen, wages and supplies, transportation of timbers by land and water, and timber market management, etc.

The present volume, for these reasons, must be rated high as an excellent result of the author's continued assiduous efforts.

Syoten OKA

Theoretical Studies in Biorheology

Dr. Syoten Oka's earlier work was concerned with theories of solutions of strong electrolytes, the theory of liquid containing polar molecules, and the theory of dielectric properties of liquids and solids. In the late 1930's he became interested in polymer science. In 1942 he published a paper on a statistical theory of molecular shape of long chain polymers in which hindrance of free rotation around C-C bonds of the backbone was taken into account. The formula for the statistical average of the end-to-end distances given there, known as "Oka equation", was an important extension of Eyring's formula applicable only to the case of completely free rotation.

After the end of the War, Dr. Oka's interest was directed mainly to the field of rheology. Numerous papers were published dealing with flows of non-Newtonian liquids through tubes and cones. In the

course of these studies he became attracted by a new field of "Biorheology", and he carried out many valuable theoretical studies concerning flow of blood in blood vessels as well as properties and phenomena in blood vessel walls. A few examples of this remarkable results are as follows:

He derived a rigorous general formula for the circumferential tension in a hollow thick cylindrical tube in static equilibrium under given values of internal and external pressures. His formula revealed that the tension inside the wall can be positive or negative depending on values of pressures and outer and inner radii of the tube. This result led to revision of the previous theory of blood vessel walls which had assumed the tension to be always positive.

Microcirculation of blood through capillaries connecting arteries and veins is an important problem in physiology, the main function of the capillary wall being exchange of water and other substances. Taking into account the transport of water through capillary walls by adopting Starling's law, he solved a hydrodynamic equation for blood flow in tubes of which a finite portion has a wall permeable to water, and thus developed a theory of interaction of blood flow and permeation of water.

Most recently he has developed a new theoretical idea for diffusion of serum albumin and similar large molecules through tissues of blood vessel walls, combining Eyring's theory of reaction rate and a concept of micro-Brownian motion in aggregates of molecules in tissues. This theory may be vitally important for clarifying the basic mechanism for accumulation of cholesterol and other substances in blood vessel walls and thus the mechanism of atherogenesis. This and related work will be summarized in the forthcoming monograph: Cardiovascular Hemorheology, by Shoten Oka (Cambridge University Press, 1981).

Dr. Syoten Oka is a physicist, but his interest is not confined within the frame of physics in the narrow sense. He is rich in curiosity, and has keen insight in identifing targets of his investigation out of raw facts and various problems in wide fields, chemistry, biology, physiology and medicine. He is a scientist who deserves to be called a "Naturforscher". It is a very natural consequence that most of his studies pioneered the development of interdisciplinary areas of science. It is to be noted, finally, that he contributed much to "educating" many younger researchers, indirectly as well as directly, by inspiring in them deep scientific motivation and aspiration.

Izumi YOKOYAMA

Structure of Volcanoes as Disclosed by Gravity Anomaly Distribution

Dr. Izumi Yokoyama has discovered that there are three different types of physical structure of volcanoes. By means of precise gravity surveys made on about thirty volcanoes in the world, he found that volcanoes can be classified according as whether there is:

a) no remarkable mass anomaly,

b) positive mass anomaly,

or

c) negative mass anomaly

below their mountain bodies.

On each of the volcanoes, Dr. Yokoyama measured gravity values at 50–100 points by gravimeters with accuracies of a few hundredth of a mgal (10^{-3} cm/sec^2), together with their heights above the sea-level with accuracies of a few centimeters. After making corrections to the observed values for the effects of heights, surrounding topographies and earth-tides, he compared the resulting values with those given by the Standard Gravity Formula for respective points and obtained the distribution of gravity anomalies $\Delta g_0''$ ($=g_{\text{calc.}}-g_{\text{obs.}}$) on each volcano. From the distribution, he could calculate the size, shape and amount of underlying anomalous mass. The total amount of anomalous mass ΔM could be found by a modified theorem of Gauss

$$2\pi G\Delta M=\int_{-\infty}^{\infty}\int_{-\infty}^{\infty}\Delta g_0''(xy)dxdy$$

(G: Universal constant of gravitation).

It was according to this ΔM that Dr. Yokoyama classified volcanoes into a), b) and c).

In the first type a), Mt. Fuji for example, ΔM is almost zero. There is no need to consider that a big magma reservoir exists below the mountain so far as gravity values are concerned. Taking this together with the results of geological observations that the mass proper to the mountain is rather small as compared with its apparently majestic size, the volcanic material must have come up to the surface through narrow channels from the depths.

In the second type b), Mihara, Idu, for example, ΔM is remarkably positive and is calculated to be 10^{10} tons. The lines of equal $\Delta g_0''$ are approximately concentric with the crater at the center where $\Delta g_0''$ is the largest. Judging from the distribution of $\Delta g_0''$, the positive anomalous mass is nearly spherical in shape, 6 kms across with

the center at a depth of several kms and 0.1 gr/cm^3 higher in density than that of the surroundings.

In the third type c), Kuttyaro, Hokkaido, for example, ΔM is negative and -8×10^{10} tons. The distribution of $\Delta g_0''$ indicates that low density materials are deposited in the form of a bowl, having a diameter 22 kms and largest thickness of 3 kms at the center, with no indication of discontinuous depressions. According to Yokoyama, these low density materials are a compound of debris of the volcano body and fallout, mixed in half and half. Volcanoes in this c) type are common in having large calderas. The negative mass ΔM and the caldera diameter R are related as

$$\Delta M \propto R^{3.6}.$$

With contrast to this, the relation for meteoric craters is

$$\Delta M \propto R^{2.5}.$$

It is to be noted that the powers of R in both expressions differ significantly from 3.0.

Seeing that few studies of this sort have been made in the world, Yokoyama's investigation is an important contribution for understanding physical structure of volcanoes.

Masanao MATSUI and Kenji MORI

Studies on the Syntheses of Organic Natural Products

Many organic natural products show remarkable biological activities. Their chemical syntheses are of utmost importance, for they themselves, their synthetic modifications and their synthetic are often used practically as agrochemicals or medicinals. Drs. Matsui and Mori carried out extensive synthetic works in the field of bioactive natural products as described below.

1) Rotenoids and pyrethroids are well-known naturally occurring insecticides. In 1960 they achieved the first total synthesis of rotenone, which opened the door to the general synthetic method of rotenoids. As to pyrethroids their effort on the synthesis of chrysanthemic acid and its analogues contributed much to the development of synthetic pyrethroid industries.

2) Phytohormones are known to regulate plant growth and development. The gibberellins are structurally most complicated among them. The monumental first total synthesis of gibberellins A_2, A_4, A_9 and A_{10} was complete by Drs. Matsui and Mori in 1968. Other plant growth regulators such as colchicine and abscisic acid were

also synthesized.

3) Chemical studies on insect metamorphosis are now actively pursued by bioorganic chemists. In 1967 Drs. Matsui and Mori were the first to synthesize juvabione, a compound with juvenile hormone activity. They also synthesized Juvenile Hormones I, II and III. In addition they discovered some juvenile hormone analogues which were more potent than the natural juvenile hormones on silkworm, *Bombyx mori*.

4) Elucidation of the chemical communication system among insects is one of the most exciting development in modern entomology. Since 1973 Drs. Matsui and Mori clarified for the first time and most extensively the absolute stereochemistry-pheromone activity relationship by synthesizing highly optically pure insect pheromones. As the result of their pioneering work, stereochemical consideration has now become the essential part of pheromone science.

Their other works are also noteworthy. A unique synthesis of vitamine A was planned and achieved. They synthesized many microbial products, aroma and flavor compounds and sugar derivatives.

Their contribution in natural products syntheses is indeed remarkable not only on the basis of chemical standards but also in view of practical applications and structure-bioactivity correlations.

Reiji NATORI

Studies on the Mechanism of Muscular Contraction by the Use of Skinned Fiber Method

The skinned muscle fiber, or Natori's fiber, is a muscle model invented by Dr. Natori in 1949. It is a muscle fiber from which the sarcolemma is removed. Before this discovery, it was a common belief of muscle physiologists that even a very small injury would bring about contracture of the whole muscle fiber. Dr. Natori, however, carried out the removal of the sarcolemma in oil and succeeded in keeping the whole fiber completely in a relaxed state.

This remarkable discovery, a challenge to conventional thought, had an important implication, i.e., the excitation at the sarcolemma would be separable from the contractile system, thus contributing a great deal to the establishment of the concept of 'excitation-contraction coupling'.

New aspects of muscle physiology have been explored by the use of this muscle model. For instance, Dr. Natori himself showed that

electrical stimulation of skinned fiber could induce a propagative contracture in it. This was quite against the idea of muscle physiologists of the time. Now we know that the muscle cell has an intracellular membrane system, which conducts electrical phenomena usually in a transverse way, but occasionally in a longitudinal way.

The fact that Natori's fiber still exhibited passive tension on stretch strongly indicated the existence of unknown elastic network inside the cell. Indeed, a protein responsible for this elasticity has been isolated and named connectin.

Thus the skinned fiber is one of the most useful experimental tools in the history of physiology, almost comparable to the squid giant axon.

PROCEEDINGS AT THE 750TH GENERAL MEETING

The 750th General Meeting of the Academy was held on Thursday, June 11, 1981, at 1:00 p.m., Dr. Hiromi ARISAWA, President, taking the chair. Eighty-six members were present, and the following communications were made:

On revision of the law of succession in Japan . . . . . Tomohei TANIGUCHI, M. J. A.

About the history of local banks of Japan . . Takao TSUCHIYA, M. J. A.

On the isomonodromic deformation for linear ordinary differential equations of the second order . . . . . Tosihusa KIMURA

The incompressible limit of compressible fluid motions in a bounded domain . . . . . Rentaro AGEMI

On the solvability of Goursat problems and a function of number theory . . . . . Masafumi YOSHINO

An analogue of Paley-Wiener theorem on a real rank 2 semisimple Lie group. The case of 1 dimensional τ-spherical functions . . . . . Takeshi KAWAZOE

Non-commutative Lorentz spaces associated with a semi-finite von Newmann algebra and applications . . . . . Hideki KOSAKI

On asymptotic equivalence of bounded solutions of two integro-differential equations . . . . . Moses A. BOUDOURIDES

Above six, communicated by Kôsaku YOSIDA, M. J. A.

Jurassic formations in the Mino area, central Japan . . . Shinjiro MIZUTANI, Isamu HATTORI, Mamoru ADACHI, Koji WAKITA, Yukinobu OKAMURA, Satoshi KIDO, Ichiro KAWAGUCHI, and Satoru KOJIMA

Communicated by Teiichi KOBAYASHI, M. J. A

Collision between two columnar objects. IV. Repulsion coefficient and impact force . . . . . Genrokuro NISHIMURA

Collision between a rectangular bar and a rectangular beam of both ends clamped. Impact force and kinematics . . . . . Genrokuro NISHIMURA and Tatsuo NARABAYASHI

Above two, communicated by Koji HIDAKA, M. J. A.

Morphology change of exsolution lamellae of pigeonite in bushveld augite—an electron microscopic observation— . . . . . Masao KITAMURA, Masayo YASUDA, and Nobuo MORIMOTO

On sodic plagioclase in some rocks of the Sanbagawa metamorphic belt in the Bessi district, Sikoku, Japan . . . . . Masaki ENAMI

Above two, communicated by Seitarô TSUBOI, M. J. A.

On Cayley-Aronhold realizations of $\mathrm{sl}(n+1, K)$ . . Hisasi MORIKAWA

On Eisenstein series for Siegel modular groups. II . . . . . Nobushige KUROKAWA

On a certain decomposition of 2-dimensional cycles on a product of two algebraic surfaces . . . . . Mariko OKAMOTO

Some explicit formulae in the theory of numbers . . . . Akio FUJII

Above four, communicated by Kunihiko KODAIRA, M. J. A.

Muscle trophic factor is identical to transferrin . . . . . Ichiro KIMURA, Takayuki HASEGAWA, Tsutomu MIURA, and Eijiro OZAWA

Fe^{3+} promotes *in vitro* growth of myoblasts and other cells from chick embryos . . . . . Takayuki HASEGAWA, Koji SAITO, Ichiro KIMURA, and Eijiro OZAWA

Transferrin is an essential component of chick embryo extract for avian myogenic cell growth *in vitro* . . . . . Ichio II, Ichiro KIMURA, Takayuki HASEGAWA, and Eijiro OZAWA

Notes on preparation of leiotonin . . . . . Setsuro EBASHI, M. J. A., and Hideko NAKASONE

Above three, communicated by Setsuro EBASHI, M. J. A.

On ranked linear spaces. II . . . . . Teruko TSUDA

On the regularity of arithmetic multiplicative functions. III . . . . . J.-L. MAUCLAIRE and Leo MURATA

Above two, communicated by Shokichi IYANAGA, M. J. A.

Studies on hemoglobin metabolism. VII. Intrahepatocellular site of the incorporation of heme and globin moiety of hemoglobin-haptoglobin after intravenous administration to rats . . . . . Satoru OSHIRO and Hiroshi NAKAJIMA

Studies on hemoglobin metabolism. VIII. High-performance liquid chromatographic analysis of the biliverdin isomers obtained by degradation of heme or heme proteins *in vitro* . . . . . Tokio YAMAGUCHI, Kuniko DAIZEN, Hiroshi NAKAJIMA, and Yasuo KOMODA

Above two, communicated by Kenji YAMAOKA, M. J. A.

Criteria for the $^{12}C/^{13}C$ ratio of carbon stars by line profiles of ^{13}CN . . . . . Yoshio FUJITA, M. J. A.

After a recess during which the members present met in their respective Sections, the General Meeting was resumed for business transactions.

First, the Chairmen of both Sections made reports on the matters dealt with at the respective Sectional Meetings.

Then, it was reported on the result of election of half the members of the Administrative Committee, which had taken place at the Sectional Meetings.

The Committee members elected are: Seiichi IWAO, Tsunahiro KIKUI, Yoshitaro WAKIMURA, Yoshio FUJITA, Takayuki SOMIYA, Kiyoshi MUTO, Naohide HIRATSUKA, and Teizo OGAWA.

The Meeting adjourned at 4 : 30 p.m.

日本学士院紀要

昭和五十六年六月　第五十七巻A　第六号

昭和五十六年七月五日　印刷
昭和五十六年七月八日　発行

編集兼発行者　日本学士院
東京都台東区上野公園七の三十二

印刷所　株式会社東京プレス
東京都板橋区桜川二丁目二七の十二

印刷者　依田高夫
東京都板橋区桜川二丁目二七の十二

Printed by
TOKYO PRESS COMPANY LIMITED
No. 27-12, Sakuragawa 2-chome, Itabashi-ku,
Tokyo 174 Japan
Tel.: (932) 9291～4