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ABSTRACTS OF THE LECTURES DELIVERED AT THE 9th HUNGARIAN CONGRESS OF BIOLOGY BUDAPEST, 6-7-8. MAY, 1970

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FOREWORD

The Hungarian Biological Society held the Ninth Biological Congress organized in co-operation with the Demographic Committee of the Hungarian Academy of Sciences and with the Demographic Research Institute of the Central Statistical Office on 6–8 of May this year.

Experts of demography, human biology, physical anthropology, human genetics and different branches of medical sciences discussed in their reports or lectures the problems of mankind which have got special importance in our days – joining to the central theme entitled "The Biology of Human Populations". This Congress gave opportunity for the experts, scientists to set forth the results and points of view of their research on the past and present biological processes of human societies. On the basis of the reports, lectures and debates heard the claim got into definite shape for a closer co-operation in order to elaborate and interpret the problems of this adjoining territory of the branches of sciences.

Beside the central theme the zoologists, botanists, genetists, microbiologists and physiologists reported on the current work on the other fields of research of biology – in accordance with the tradition of the Congress.

This volume publishes the summaries of the lectures held in sections "A" and "B" of the Congress.

Acknowledgements are to be expressed for the appreciated auspices of Professor Imre Törő, president of the Hungarian Biological Society and Professor János Szentágothai, president of the Biological Class of the Hungarian Academy of Sciences for rendering the possibility to organize the congress, as well as for the co-operation of Ottó Eiben, Mrs. Marietta Pongrácz and Kinga Éry.

In 1971 the complete text of the reports and lectures held in section "A" on demographic, human biological, physical anthropological, human genetical and medical research will be published under the auspices of the Hungarian Academy of Sciences by the Publishing House of the Hungarian Academy of Sciences in English.

DR. EGON SZABADY

MAIN REPORTS

EGON SZABADY
(Demographic Research Institute, Budapest)

DEMOGRAPHY AND HUMAN BIOLOGY

From its early beginnings in Antiquity, demography was rooted in the social rather than the natural sciences, although it is undeniable that population and its growth have important biological aspects which cannot be disregarded by demography. Gaunt, the founder of modern demography, has already emphasized the dual aspect of the new discipline, and the interdependence of demography and biology comes to expression also in the correspodence between Galton and Kőrösy, published for the first time in the author's main paper. Francis Galton, the pioneer of human biology was using in his research work on mortality tables the fertility diagrams which the demographer Kőrösy had put at his disposal.

Since the components of population growth, births and deaths, are – apart from their social contents and determinants – essentially biological and physiological phenomena, the interest of demographers in the biological and genetical factors of population growth is understandable. Over the major part of the history of mankind the biological limits of population growth were set primarily by the mortality factor; therefore, the interest of the demographers turned primarily to the biological problems connected with mortality. As mankind came gradually to conquer most of the devastating epidemics and diseases, and birth control began to make its effects felt, this aspect of the biological factors lost much of its importance and the biological questions relating to fertility gradually shifted into the centre of interest.

Whereas the biological aspect has stimulated research in several fields of human biology and contributed to the development of such border-area sciences as e.g. population genetics, the "biologism" manifesting itself in demographical theory, the biologizing interpretation of the questions of population growth, has become a cover for erroneous and retrograde views. The main schools of demography have deliberately drawn a line between themselves and biologism, engaging either in what is called pure demography or examining the demographical role of the socio-economic factors.

However, the links between demography and biological science have never ceased to exist, a fact proven by the work of Gini and Boldrini.

Present-day demography rejects "biologism" but – while emphasizing the socio-economic postulates of demographical processes – would not deny that demographical observation is frequently directed at some biological fact, that the demographical and biological measurement problems have many common traits and, finally, that in demographical phenomena biological factors are also asserting themselves and biological regularities can also be observed.

It is from this point of view that the main paper analyses the demographical aspects of the scientific branches belonging to or connected with the border areas between demography and human biology: population genetics, physical anthropology, paleodemography, human oecology and biometrics. It is pointed out that in this field, too, the tendency of our present era is asserting itself which coordinates the traditional viewpoints of research.

Both the survey of international literature and the Hungarian experiences in the field indicate that links between demography and human biology are gaining in strength and that this connection has a fructifying effect on demography. However, it is not only the centre of interest of the demographers that has shifted from the questions relating to mortality to those connected with fertility; the role of biological factors has also obtained a new interpretation. In conclusion, the main paper points out some questions and research tasks relating to reproduction, family planning and the future of mankind, which call for the joint interest, mutually complementary research work or cooperation of demographers and biologists, outlining the possibilities of cooperation in the research on female fertility, the interval between births, and the influence of external civilizatory factors on both human-biological and demographic phenomena.

JÁNOS NEMESKÉRI
(Demographic Research Institute, Budapest)

THE SUBJECT, AIM AND TRENDS OF HUMAN BIOLOGY

The subject of human biology is the structure of the human populations and to acquire information on their functional connections with the environment. Over and above the scientific objective, it is an indispensable necessity to get acquainted with the morphological, physiological and ecological conditions of man, creating his natural and artificial environment developing in an ever increasing measure in our days. The social transformation, the technical improvement and the progress of civilization taken place in the past fifty years have disunited the earlier "natural" human communities, and the new ones represent quite different systems of conditions. All these changes affect the individual and the communities in three fundamental biological phenomena. The

accelerated process of microevolution, the genetic structure of the population and physical adaptation are the three basic issues on which human biological research is centred.

IBP gauged the whole and the details of these problems on the world-scale in 1964, subsequently the questions of selection, population equilibrium, physiological adaptation, as well as the problems of population genetics, environmental effects, affinity and divergence were elaborated at the Conference organized in Wartenstein. When all these questions had been discussed, it was realized how serious shortcomings concerning the biology of human populations existed, and how sporadic were the results attained up to then about humanity populating the world. After a collection and synthesis of the results achieved hitherto in the biology of human populations, the elaboration of extensive and intensive programmes of human biology will become possible.

In Hungarian relation one could almost say that we are at the beginning of human biological research, and even these studies have been realized as results of isolated works. Evolving a uniform programme for human biological research, as a project, can be realized only if the respective domains of the special branches of human biology, midecine and social sciences develop a uniform outlock and a long-range research plan for the study of the biological processes and changes of the human populations.

JEAN SUTTER

(Institut National d'Études Demographiques, Paris, France)

DEMOGRAPHIC FACTORS AND HUMAN BIOMETRICS

Application of biometrics and developing methods for measuring are indispenable for the analysis of factors shaping the characteristics and structure of individuals and populations. As to the nature of the factors one can distinguish three groups: a) biological (demographic, genetical and ecological), b) socio-economic and, c) cultural factors. From among the biological factors studying of the following demographic characteristics is the most important from biometric aspects: sexratio, age of the mother, birth order, sex and age of the former child, consanguinity of the parents, family size, birth interval. In order to illustrate the examinations of his own and of other authors concerning the above items the report presents many examples of their applicability.

Problems of immunology, incomptability and selection are analysed from human biological aspects regarding to their effect on fertility. The analysis of demographic factors by methods of biometrics faces numerous difficulties which are to be got over in the cause of population genetical studies.

The report deals with all the fields where biometrical analyses in connection with demographic characteristics promise the possibility of a deeper knowledge of the phenomena determining human populations.

D. F. ROBERTS
(Laboratory of Human Genetics, University of Newcastle upon Tyne, Newcastle upon Tyne, United Kingdom)

GENETICS AND DEMOGRAPHY IN AN ISLAND ENVIRONMENT

The study aims to demonstrate the close links of demography with other fields of human biology.

Tristan da Cunha, a remote island in the middle of the south Atlantic Ocean has a population whose pedigree since its founding (1816) can be established. The demographic history of this population is a good pattern of isolated populations. The demographic features (first of all inbreeding) affected the genetic evolution of the population. In 1961, after a vulcanic eruption on the island the whole population of 267 individuals went to England for shelter. Then the opportunity was taken for fuller investigation of this unique population. After full clinical examinations explanation of the congenital and genetic defects entailed a very protected investigation, largly centred on the demography. The biological characteristics of members of the population could be usefully compared with their inbreeding coefficients.

Studying of the population after its resettling to the island has been continued through sanitary care and genetical examinations.

The results of the study can serve as a good basis also for methodological considerations in further investigations of similar nature.

LECTURES

Section "A"

MIKLÓS KRETZOI
(Department of Zoology and Anthropology, Kossuth Lajos University, Debrecen)

PROBLEMS IN PREHOMINIZATION

When determining the factos and trends of evolution, one is inclined to restrict their scope – founded on the principle of exclusion – to those phyletic changes and their history, in which the evolution of the genus Homo markedly deviates from the evolutional trends of Pongidae – disregarding the parallel and/or common elements of evolution. Thereby one commits the error of narrowing down attention merely to some selected groups of characters, not to mention that the processes too short in time are unsuitable for determining the trends of their development. In order to eliminate this deficiency, the author followed up the main evolutional facts and trends of the phylogeny leading from the stage of becoming Vertebrate to Man. Thus, upon a deliberate consideration of the said facts and trends, he was able to ascertain which of the elements of the evolutional mosaic resulted in the formation of man. Given the knowledge of the whole path, or at least of its most significant stages, one is provided with the opportunity – and with the right – to expand these trends and call attention to the possibilities – and also to the dangers – of their future consequences.

PÁL LIPTÁK
(Institute of Anthropology, József Attila University, Szeged)

MAN IN TIME AND SPACE

The lecture draws attention to the phenomena of major importance in the evolution and microevolution, as well as spatial differentiation of Hominidae and Homo sapiens. When examining the evolution of Hominids, one should regard it in the dialectic unity of a twofold process, bearing in mind that the phenomena cannot be understood in themselves, only together with their connections. On the one part it is change, on the other a relative constancy that render hominid evolution extraordinarily complicated.

The function of science at any time is to make order, to systematize the distinct seemingly not interrelated phenomena. Hominid variations are not continuous but discontinuous in space; this justifies their being examined in taxonomical respect. As soon as subhuman Hominids passed the threshold of hominization (the criteria of which are well-known), the populations of that time – however they may be called in the nomenclature – formed a single polytypic species.

The author makes an attempt in the lecture at systematically analyzing the evolution of Hominids, and briefly outlines the subspecies (geographical races or great-races) of the recent and similarly polytypic species of Homo sapiens.

TIBOR BAKÁCS
(National Institute of Public Health, Budapest)

BIOLOGICAL CONNECTIONS OF MAN AND ENVIRONMENT

Man developed – preponderantly by means of his metabolism – a close biological connection with his natural environment. That is to which he has adopted himself, of which the changes he is able to follow with a wide range of tolerance.

The demographic events of recent times and, within them, the acceleration of the rate of urbanization have placed man in a more and more artificial environment. This process was essentially spontaneous, and for this reason man is subject to an ever increasing number of denaturalizing effects, deleterious to his health. (A detailed analysis of these is given in the lecture.)

Where is the way out? – In taking the hitherto spontaneous process of urbanization under sanitary control.

KATALIN FISCHER and GYÖRGY KISZELY
(Institute of Medical Biology, Medical University, Szeged)

SOME DATA ON AIR-POLLUTION HARMFUL TO HUMAN BEINGS

Injuries induced by civilization threaten the biological existence of man from many sides. One of the sources of this manyfold danger is the air-pollution of the large cities, which affects numerous groups of the population – unlimited as regards of age, sex or occupation. Apart from the acute smog days, repeating but once or twice a year (although sometimes catastrophal), the factors meaning a constant biological strain seem more important. As to our present knowledge, the effect of these is not restrained to individual life, as e.g. in chronic anoxia, somatic mutations, etc., – also a teratogenic endangerment of the fetuses in the early stages of ontogenesis is imminent, as well as a genetic imperilment of the future generations.

The impurity of the air of the cities induces biological danger partly by carbon monoxyde, partly by carcinogenic hydrocarbons. Situations of this kind are to be met with especially along busy throughfares and at intersections. The investigations of the authors were directed on the one hand at the carbon monoxyde to be found in the air at the crossing with the heaviest traffic in the city of Szeged, on the other hand at demonstrating 3—4 benzopyrene in the snow at several points of the city, immediately after snowfall. The quantity of both carbon monoxyde and 3—4 benzopyrene represented a value by far surpassing the limits of biological tolerance.

These dangers of urbanization, as mentioned above, threaten the future of humanity. In order to ensure the biological intactness of man, to combat these dangers became thus a social necessity.

FERENC MIHÁLYI
(Zoological Department, Hungarian Natural History Museum, Budapest)

ZOOLOGICAL RESEARCH WORK FOR OVERCOMING THE ENDEMICS

The struggle for the prolongation of human life is on at two fronts, – at that of curing and of prevention. The first falls to medical and pharmacological research, while a continuously increasing number of zoologists join in the other. The control of malaria, yellow fever, sleeping sickness, black plague, cholera could be attained for the most part not by destroying the pathogens but by recognizing and fighting off the vectors.

Malaria has been practically eliminated in the temperate zone, and the gravity of other epidemics propagated by vectors has decreased to a considerable degree. In Hungary the decisive bettle against malaria took place in 1949, and not a single case contracted in this country occurs any more. This was enabled by thorough zoological preparation. Most detailed research work is in progress in human parasitology, regarding tularemia, leptospirosis, amoebic dysentery and helminthosis.

Also the study of the question of flies has been taken up again. Situation in cities has worsened in this regard since the war. In villages, however, it improved in consequence of an extensive use of contact poisons as insecticides. Intense studies were conducted in flies developing in or subsisting on human feces. The flies of feces left in the open were examined by J. B. Szabó and F. Mihályi, the reproduction of flies in the privies by M. P. Aradi. The swarms of flies in the Budapest food markets are startling. The material of M. P. Aradi' s thorough collectings there was worked up by F. Mihályi who has cleared up this situation. The search for the breeding sites of the flies of the Budapest markets is a task to be performed in the near future.

TIBOR HORTOBÁGYI
(Department of Botany and Plant Physiology, University of Agricultural Sciences, Gödöllő)

THE MICROFLORA OF THE SETTLING- AND RECHARGE BASINS OF THE BUDAPEST WATERWORKS

The increasing water requirement gives continuously more trouble to the Budapest Waterworks. Also the recharge basin set up at the Pumping Station No. 1. takes part in meeting the demands. The water seeped in at a rate of 1.9 m per day at first, however, in 3–4 weeks the value of seepage decreased by as much as 50 percent. The reason for this was: living and dead organic as well as inorganic floating substances seeped in and clogged the filter bed.

Upon request of the Budapest Waterworks a team was formed with Dr. Árpád Berczik in charge of the work, for clearing up the biological and hydrobiological causes of the obstruction of the settling- and recharge basins. The complex (physical, chemical, botanical and zoological) and simultaneous collecting work and its evaluation took place from May 1968 to October 1969, with the aim to enable, relying on the data, findings and observations, the prevention or at least a decrease of the drop in the rate of inflow. The Budapest Waterworks cannot give up groundwater recharge.

Among the basins appointed, the settling one rises somewhat above the relief, being half surrounded by a dam. As compared with the relief, the recharge basin lies 3–4 m deep. The wall of the settling basin is perpendicular, it is divided by walls protruding from its longitudinal side. The side-walls of the recharge basin enclose an angle of 40°, and are protected by concrete slabs. The basins differ as to conditions of light, the settling basin is overshadowed by trees, the surroundings of the recharge basin are unwooded. The depth of the water in the settling basin is 120 cm, that in the recharge basin about 70 cm. Light conditions in the settling basin are mainly influenced by floating material of mineral and, in the recharge basin, of biological origin. Submerged vegetation is to be found in the settling basin. The temperature of the water in the recharge basin is higher by some degrees C, since the water arrives there from the settling basin, its flow is slowing down, and also the concrete slope contributes by raising the temperature. Wind power acts to a greater measure in the settling basin. Lasting and significant differences in heat and flow appear in the basins.

At the increased photosynthesis, the quantity of hydrocarbonate and calcium ions is smaller in the settling- and recharge basins (to an increased measure in the latter) than in the Danube. pH is lowest early in the morning, then it rises, – at night it decreases; its fluctuation with the parts of the day can surpass 3 units. The values of ammonium, nitrite and nitrate ions are identic with those in the Danube. SiO_2 decreases, owing to the multiplication of the diatoms. The values of O_2 consumption, of solute O_2 are the same in the basins as in the Danube (E. Kozma). The quantity of the floating substances increases (especially in the recharge basin) as a consequence of the propagation of plankton organisms.

Great numbers of algae of a most varied appearance as regards both quality and quantity are to be found in the basins. The more than 400 identified taxa mean a particularly high number, if compared with the organisms observed in the still waters and water courses of Hungary. Their large-scale appearance indicates that the organisms arriving there mostly with the water of the Danube, get among most favourable conditions already in the settling basin, where the water flows slowly. Their conditions are even better in the recharge basin: the heavier settlement is resided in the settling basin, conditions of light improve, the water temperature rises, the flow decreases, and food supply from the Danube is continuous. It is easy to understand that, upon favourable meteorological conditions also mass-production develops. In this way microscopical vegetation contributes to clogging to a considerable degree.

From the Danube to the recharge basin a change of environment takes place, resembling in many respects that in the storage reservoirs of water courses or in the fish-ponds. The reservoirs do not dry until the water of the basins is released in the upkeep periods. This reminds of the situation in the ponds following the fishing up of the stock in the autumn. On the other hand, it is a most important factor of selection, modification and mutation, apt to develop and preserve new forms. Hence it is easy to understand why in the basins a relatively great variety of organisms of unusual appearance is to be observed, hitherto unknown and new for science. Relying on the results of the analyses, the biocoenosis of these organisms resembles that of the eutrophic shoal waters of highly intense productivity.

As to quality, the widest veriety of algae, 261 belong to the order Chlorococcales of the green algae. The genus Scenedesmus numbers 126 taxa in itself. Diatoms are represented by 40, blue algae by 32 taxa. The same algae are sicnificant also regarding quality. Their occurence varies from a few specimina per litre up to nearly 100 percent. The Microcystis specimena cause water blooming. In several collections Planctomyces Békefii Gim. of the plankton fungi appears in considerable number, which is especially remarkable in respect of pollution.

The single strains of algae participate in the formation of coenosis with great variety. This can be explained partly by the variety of the oecological spectre and unusually great number as regards taxa of the organisms, partly by the varied environmental factors. Quantitatively the index number alga per litre fluctuates between 17 and 31 million in summer, i. e. in the most intense period of recharge.

Most of the algae to be appreciated in respect of saprobiology are beta-mezoaprobic, truly reflecting the condition of the Danube as feed-water.

Micro-flora examinations were carried out relying on scooped samples of definite volume, by means of the phase-contrast method and, according to necessity, with the immersion method, using suitable reagents.

GYÖRGY ÁDÁM
(Department of Comparative Physiology, Eötvös Loránd University, Budapest)

ON CERTAIN QUESTIONS OF THE PSYCHOBIOLOGY OF MAN

The problems of the biological fundaments of the human mind are in the centre of neurophysiological and experimental psychological research in our days. Founded on the literature and on the author's own research, the lecture discusses in detail the most pressing problems, and gives the outlines of some important and for their most part as yet uncleared fields of knowledge. Presenting the results attained in the biology of learning and memory, in the field of the physiological mechanisms of consciousness and unconsciousness, as well as in the research of the physiological fundaments of the exteroceptive and interoceptive effects influencing the psychic functions, the lecture discusses the open questions, the "blank spots", the approach to which is indispensable in the future development of brain research and experimental psychology.

RICHÁRD BACKHAUSZ
("Human" Institute for Serobacteriological Production and Research, Budapest)

BIOLOGICAL SIGNIFICANCE OF IMMUNOGLOBULIN RESEARCH

1. Classification and structure of the immunoglobulins.
2. Relation between immunoglobulins and antibodies.
3. Allotypic characteristics of the human immunoglobulins.
4. Allotypic characteristics of the animal immunoglobulins.
5. Genetic problems of immunoglobulin abnormalities.
6. Philogenetic questions of the immunoglobulins.

IRÉN BERNÁD and TAMÁS ÁCS
(Institute of Histology and Embryology, Semmelweis Medical University, Budapest)

THE RESPONSIBILITY OF BIOLOGISTS

The significance of the biological sciences is rapidly increasing in our days. The pertinent problems can be grouped around the following questions:

1. The significance of biology in production and technology. Within this: a) at the rapid increase in number of humanity, the traditional methods of food production have

become insatisfactory, the results of production biology need to be applied to a higher degree in production, – therefore new ways are tried to be found all the world over (fodder-protein production by bacterial way, from non-protein substances); b) biological techniques gain ground (in purification, in the exploitation of mines, application of enzymatic and bacterial methods in corrosion protection); c) the significance of biological principles in technology is increasing (logical automata – research of the nervous system, of sense organs – telecommunication technique, radar systems).

2. The influence of technology on the living world and on man. Within this: a) man interferes more and more effectively with the order of the living world. The disorganization of the coenoses involves great dangers if the consequences cannot be scientifically determined in advance; b) the progress of technology has dangerous side-effects on man (mutagens, pollution of water and air, noise, etc.). The tolerance of man can set limits to the spread of the feats of engineering. A precondition to the measures needed in technology is a full knowledge of man's tolerance.

3. Man's direct interference with the forming of man. Man obtains a novel kind of power over man. Birth control, organ transplantation come into extensive use, chemical influencing of thought and learning is to be expected, as well as a chance to interfere with the genetics of man. All these factors influence not only production, they also affect the legal system and the moral ideas. The progress of biology may mean a blessing for humanity or its ruin, – all this greatly depends on social conditions.

Up to the present only the responsibility of physicists has been emphasized. However, also the responsibility of the biologists in forming the fate of humanity is growing more and more.

GYÖRGY LENART
(János City Hospital, Budapest)

CONTRADICTORY INTERESTS OF THE INDIVIDUAL AND THE POPULATION AND THEIR RECONCILIATION IN THE WORK OF GENETIC GUIDANCE

In medical science the importance of prevention is steadily growing. Not only is prevention introduced at ever earlier stages of individual life, but lately even pre-conceptive prevention has been attempted. With this "anticipation" of prevention, however, an apparently dangerous conflict reveals itself, a conflict between the present interest of the individual and the future interest of society. The author examines this alleged antagonism and expects, as the result of his investigation, a reconciliation of the differences.

ANDRÁS KLINGER
(Central Statistical Office, Budapest)

BIOLOGICAL FACTORS INFLUENCING FERTILITY

In his lecture the author does not deal with the factors determining the size of fertility (with the problems of fecundity and natural fertility resp.,) but only summarizes the following problems influencing fertility:

1. The viability of the new-born, i.e. the proportion of still-births in the total number of births fell back from 25–30 per mill in the years before World War II. to 20 per mille in the 50's and to 10 per mille in the last years. Causes of accounting must also have played an important part in this decrease: while since 1950 the proportion of still-births has fallen back to nearly its half, and the proportion of the new births of a very small weight (under 1500 g) showing any evidence of life (regarded, therefore, as live-births) has nearly trebled, the joint proportion of those belonging to the two groups, has remained unchanged. The rate of still-births is considerably influenced by the age of the mother (their frequency increasing parallel with age), by the order of birth (their frequency increasing with the order of birth) and by the interval between births (repeated births increasing their frequency). The fact that the socio-economic and cultural situation of the mother is also an influencing factor points to the not exclusively biological character of the frequency of stillbirths.

2. The sex ratio of the new-born can be explained, as a rule, by biological causes. Whereas before World War I only 105 boy births could be recorded per 100 girl births, after World War I this proportion increased considerably, then it fell back again and increased at a slow pace after World War II. In the last years there is again a considerable surplus of boy births (108 per 100 in 1968). This can be explained by demographic causes. For the frequency of boy-births is higher in the younger than in the older age and the proportion of boy births is higher among first and third births. Thus as a result of the decrease in the number of births – which has considerably increased the proportion of births of young mothers with a low order of birth – the crude index of masculinity has increased, although the standard rate has remained unchanged or even has decreased.

3. The proportion of multiple births fell back from 2,3 per cent before World War II to 1,8–2,1 per cent in the 60's. The changes in our natality, the getting younger of our mothers have played a role in this above all.

4. Of the physical criteria of the new-born weight at birth in the most important. In the last 15 years the average weight at birth of the new-born has decreased by 7 per cent. Two different tendencies have contributed to this: the proportion of those with a large weight at birth has decreased, at the same time, however, the proportion of those with a small weight at birth has considerably increased (the so-called early-births under 2500 gs amount to 11 per cent of all live-births as against 6 per cent in 1953.) Causes of accounting have also played a role in this change besides the actual decrease of weight.

5. The seasonal fluctuation of births has also a biological background. In the past 80 years in Hungary the maximum value of births could always be experienced in the late winter or early spring months (most frequently in March); their minimal value can be observed as a rule, in early winter (most frequently in December). The impact of the natural-geographical and climatic factors on the conceptions is also supported by international data; for with the renewal of Nature (with the advent of spring) in the different areas of the Earth the monthly maximum of births can be recorded either sooner or later.

BÉLA HORN
(Department No. 1. of Obstetrics and Gynaecology, Semmelweis Medical University, Budapest)

TIMELY PROBLEMS OF PREMATURITY

Prematurity is a great problem in general because of its numerous unsolved questions and especially for us, because of the extraordinary high and increasing rate of its frequency in this country. The author endevours to establish whether any causal factors do exist the elimination of which might favourably influence the frequency of prematurity in a relatively short time. He is studying also the question whether the high rate of prematurity in Hungary is due to any special causes. Regarding prevention first of all the possibility and preconditions of the intensive ante – and postnatal care should be cleared up. Special problems of attending the premature births as well as provision of the premature infants are mentioned. Comparison of the birth-weight and the duration of pregnancy and the use of percentil-standard involves the necessity of a partial alteration of the nomenclature. Namely a birth-weigt under 2500 gs does not necessarily mean prematurity. A significant part of such infants are mature but retarded in development ("small for date") and originate from a pregnancy longer than thirty seven weeks.

This is not only the problem of nomenclature but that of early detection of defects of intrauterin development. It rises numerous problems of diagnostic and prognostic nature. Early diagnosis helps reduction of foetal damage, and may enable us to prevent serious complications after delivery. It is to be stated that close cooperation of gynaecologists and paediatricians is essential in solution of the question.

ENDRE CZEIZEL and GÁBOR TUSNÁDY
(National Institute of Public Health, Budapest and Mathematical Research Institute of the Hungarian Academy of Sciences, Budapest)

SOME BIOLOGICAL ASPECTS OF DIFFERENTIAL FERTILITY

With the increase in extensity and intensity of family planning, fertility is markedly differentiating by social strata and, within the reproductive age, by age categories. It appears from the analysis of Hungarian birth data, that fertility varying by social strata is

unfavourable concerning the trends of average birth weight and frequency of low birth-weight neonates. At present, namely, it is preponderantly the families living under hard social conditions who take the responsibility of having 4 children or more, and in the case of such one should reckon with lower birth-weights. As the examination of birth-weight by the order of births and the ages of the mothers have proved, this category makes its effect felt already in the national statistics. With increasing birth-control, the average age of mothers (and fathers) at the birth of their children has become considerably lower. In this way the frequency of the genetic injuries occurring in the first place in older age (autosomal trisomia, multifactorial hereditary diseases) is decreasing. At the authors' calculation an about 14 percent decrease of late foetal deaths (still-births) and an about 33 percent one of the incidence of Down's disease can be attributed to the circumstance that mothers bear at younger ages.

GYÖRGY ACSÁDI and ENDRE CZEIZEL
(Central Statistical Office, Budapest
and National Institute of Public Health, Budapest)

THE CHARACTERISTICS OF MULTIPLE BIRTHS IN HUNGARY

In Hungary the proportion of multiple births is decreasing; in 1920 it amounted to 23,5 per mille, while in the early 60's it did not reach even 20 per mille. This frequency corresponds with proportions observed internationally, though it belongs to the lower ones. In the average of 1959–68 the frequency of twin births was 1/1006, that of triplets 1/10929, which rate is close to the rate of 1/10111, expected on the basis of the Hellin hypothesis. Quadruplets were born more often (1/704936) than expected (1/1016701). In case of multiple births the sex-ratio is more balanced (1016 in 1968) than in the total number of births (1064 in 1968). Within twin births among the first born the number of boys is definitely higher (1093). 1,8 percent of the multiple births are still births as against 1,0 percent in the total number of births. The average weight at birth of multiple births does not reach even the weight limit of 2500 gs of premature births; twin births represent 12 percent of all premature births. By origin twin births can be divided into two entirely different groups. On account of the separation of the supernumerary ova, twins from two ova are the results of fertilizations through separate sperms, i.e. they are essentially siblings born at the same time. Twins from one ovum are the results of the usual fertilization of one ovum through one sperm, subsequently however, the ovum splits into two, probably as a result of its developmental ailments. Thus twins from one ovum contain the same genetic material totally. The importance of the study of twins lies in the fact that it makes possible the determination of some property or of certain hereditary disease quantitatively. This justifies the registration of twins in Budapest as from January 1, 1970, including all twin births of the capital; the type of twins is determined by up-to-date methods. In a given twin population the distinction of twins from one ovum and from two ova takes place by means of the Weinberg calculation. With the advancing age of the mother the frequency of twins from two ova increases and reaches its maximum between the age of 35 and 39 years. In 1968 the maximum was in

the age group over 40 years. According to the data of 1960 and 1968 a higher proportion of twin births could also be experienced among the 16 year old and younger mothers; the frequency of twins from two ova increases parallel with the increase of the birth order, while, with advancing age, the frequency of twins from one ovum does not increase considerably. It is surprising that – according to the data of 1960 and 1968 – twin births from one ovum occur similarly more frequently among the 16 year old and younger mothers. The frequency of twins from one ovum is independent of the order of birth. The increase of the frequency of twins from one ovum is the result of the decreasing fecundity of older mothers, while the same phenomena is responsible for the decrease of the rate of twin birth in general too.

KÁROLY MILTÉNYI
(Central Statistical Office, Budapest)

THE IMPACT OF INDUCED ABORTIONS ON FERTILITY

The paper compares the Hungarian fertility data partly with the West African data, partly with the Hungarian data of the 19th century. The author states the differences according to the order of magnitude and composition of fertility, in respect to the extent of birth control. He analyses fertility and the role played by contraception and induced abortion in birth control. In Hungary from the end of the past century till the middle of the 20th century more than 2/3 of birth controls was carried out by contraceptions; as its result the rate of pregnancy fell back considerably in the same period. Since 1957, however, after the legalization of induced abortions, simultaneously with the decrease of the number of births, the rate of pregnancy increased considerably and so did the number and proportion of induced abortions within birth control. The much shorter interval between the pregnancies of the surgically aborting women than that of the child-bearing women has also contributed to the increase of pregnancy-rate.

Of the factors leading to the backwardness of contraception the author points to the lack of proper knowledge, to the limited spread of up-to-date and efficient means of contraception, and, above all, to the absence of motives.

JENŐ SÁRKÁNY
(Heim Pál Hospital for Children
Department of Paediatry No. 1., Postgraduate Medical School, Budapest)

ON SOME ASPECTS OF EARLY NEONATAL MORTALITY

The specific character of the new-born age is determined by the high rates of mortality (which it is difficult to influence) and irreversible lesions. The adaptability of foeti to extrauterine life is different in the various categories of foeti. In spite of developmental, constitutional and biochemical abnormalities the intrauterine development may be more

or less normal, while adaptability to extrauterine life may be hindered or impossible. The main forms of adaptability in the new-born age are: cardio-respiratoric, enzymatic-metabolic and neuro-endocrin. The adaptability has considerably decreased of infants prematurely born and of foeti which underwent atrophy within the uterus as well as of foeti affected by the mechanical, hypoxial and other burdens of delivery. This may lead to a hundred-fold increase of the rate of mortality as compared with that in the optimal category with a weight of 3000–4500 gs. It iis the aim of every country to have the highest possible proportion of mature foeti and the lowest possible of immature foeti. In the last 15 years in Hungary the proportion of new-born with a small weight has increased, accordingly the results actually achieved in the social development and medical care could not manifest themselves fully in the indices of mortality and morbidity. It has been proved by statistical data that the noxa, which is responsible for the changes observed, did not affect evenly the women of our country, but affected the foeti of mothers aged 25 years and over as well as the foeti with the 2nd, 3rd and higher birth order to an ever greater extent. The lowest proportion of premature births could be found among first born and among those whose mother was under 20 years of age. The selective character of the lesion does not make it probable to suppose the impact of such factors (for instance, urbanization, industrialization, smoking, etc.) as affect more or less the whole female population.

MARIETTA PONGRÁCZ
(Demographic Research Institute, Budapest)

SOME CHARACTERISTICS OF INFANT MORTALITY IN MIDDLE EASTERN EUROPE

The trend of infant mortality is one of the most reliable reflections of the sanitary conditions and their changes. Significant conclusions can be drawn, therefore, from a comparison of infant mortality rates prevailing in the individual countries. No such comparative analysis among the countries of Middle Eastern Europe has been done so far.

The examination of the trends of infant mortality in the said countries – Bulgaria, Czechoslovakia, Poland, Jugoslavia and Hungary – is performed concerning the period 1957–1967, primarily by means of the raw infant-mortality rate, the next step being the comparison of the values by sex.

The most important part of the analysis is to examine the distribution of infant deaths by causes. Within this, first of all the distribution of deaths by endogenous and exogenous causes, as well as the absolute and inter-compared decrease of these causes of death, further the biological background and differing health conditions of the decrease in the individual countries would be in the centre of the question.

In the detailed analysis by causes of death founded on the International Classification of Diseases and Causes of Death – Intermediary List (A1–A150) the deceased infants are examined by age groups and causes of death, with special regard to deaths ensued at the ages 0 and 1–6 days. During this period deaths are brought about primarily by the

endogenous causes, and the so-called lethal factors have a part in the trend of the perinatal deaths. On the existence of these latter, however, one can conclude only from the results of genetic research.

EMIL PALLÓS
(Demographic Research Institute, Budapest)

THE LIFE TABLE AS A MEANS OF HUMAN BIOLOGICAL STUDIES

The life table is one of the most important means of examining deaths by ages. Its mathematically exact indices: probability of death (q_x), order of survivorship (1_x), expectation of life (e_o), etc., suit well for measuring and comparing the collective and differentiated effects of several factors influencing mortality.

The tables of various purpose and designation enable a separation of the effects of the various biological and socio-economical factors influencing mortality, thus by their means the endogenous and exogenous causes of the structural changes in a population and/or population category can be determined, and the tendency of their future development can be assessed.

From the tables compiled by regions one can draw conclusions regarding the mortality conditions of the cities, villages and districts.

The tables on diseases and/or causes of death can serve as a basis not only for the sanitary provisions to be passed, but by their means the effects of the individual diseases or causes of death can be determined according to age, occupation, geographic situation and character of the settlements.

No comparison of scholarly character of mortality in the different ages (historical periods) can be effected without life tables. Founded on them, the age structure and duration of life among historical populations can be reconstructed.

By means of marriage – and birth tables, drawn up on the model and with the method of the life tables, calculations can be carried out for determining the reproduction, as well as composition according to family status of the population and the future trends of these.

In the study of the biological, physiological, evolutional changes of human populations and, particularly, in the analysis of the causes of such changes, properly elaborated and differentiated life tables are indispensable means.

ENDRE SOMOGYI, IMRE KENYERES and GYULA SZUCHOVSZKY
(Institute of Forensic Medicine, Semmelweis Medical University, Budapest)

THE TREND OF EXTRAORDINARY MORTALITY IN BUDAPEST IN THE YEARS 1960–69

During the 10 years under examination, about 35.000 extraordinary deaths occurred in Budapest. The authors analyse the material from the official post-mortem examina-

tions of the deceased. This material is not wholly known even by the general medical public. The authors study the distribution of the various sorts of death – accident, criminal act, suicide and/or natural disease – and the changes in the frequency of these. Within this, they also discuss some data of major importance in the trends of certain causes of death. Founded on the numerical data of their material, they present some suggestions concerning public health, sanitary organization and social policy, by the realization of which the number of extraordinary deaths – at least in respect of certain causes of death – could be decreased.

ÁGNES B. LUKÁCS
(Demographic Research Institute, Budapest)

MORTALITY ESTIMATES AND POPULATION STRUCTURE

The overwhelming majority of the researches in historical demography deal with mortality, although they should rather be directed at a full exploration of the demographic pattern of the single periods of history by considering it as a basic factor of the contemporary socio-economical conditions. However, such complex demographic-historical-economical investigations can be carried out either by teamwork or are to be limited to very short periods only.

The author limited her researches to the demographic conditions of the first third of the 19th century – to be observed within the boundaries of contemporary Hungary proper under civil administration. The starting archival mortality data which served for basis of guesses rather than of estimates – were compared to data taken of the contemporary demographic literature. Besides – as a second step – the number and the rate of growth of population in the individual municipalities as well as of the whole country were determined by the means of linear trend-estimations. Then, by assuming the quasi – stability of the population with the aid of regional model life tables elaborated by Coale and Demény, the agestructure of the population was determined. The agestructure is a starting point of further demographic and socio-economical researches and serves also as a basis for human-biological investigations.

LÁSZLÓ CSEH-SZOMBATHY
(Central Statistical Office, Budapest)

THE BIOLOGICAL ASPECTS OF THE DEMOGRAPHIC EXAMINATION OF THE OLDEST

Following the population census of 1970, the Central Statistical Office conducts a survey among the oldest inhabitants (those over 80 years of age, with the purpose to collect data for the study of their demographic, social and sanitary characteristics, as well as their customs connected with alimentation. Although among the central problems of the survey there are no questions of biological character, the results of the survey can still promote research in the biological relations of senescence.

At the time of the recent survey of the Central Statistical Office, about 140.000 persons of 80 or more years of age were living in Hungary. At the time of the preceding census, in 1960, their number was 109.000; consequently, during 10 years the number of the oldest grew by nearly 30 percent. By today 1.4 percent of the population belong to this age group, while at the beginning of this century their rate was only 0.5 percent and their number hardly surpassed 30.000.

Beholding this marked increase in the number of the oldest, first of all the question arises: what were the changes to bring it about? The answer is expected in the first place from the examination of social, economical and sanitary factors. On the other hand, to the necessarily arising second question: why was it just those old people of the group, who were examined, who lived to this great age, the answer is expected from biological research in the first place. The examination conducted by the Central Statistical Office will help in this research by clearing up the trends of expectancy of life with the parents, brothers and sisters of the oldest, by establishing the main stages of their lives and by presenting a picture on the significance of the other – social, economical, sanitary, etc. – factors, also enabling thereby the selection of these to be applied at drawing up a synthesis of biological character.

EMIL VALKOVICS
(Demographic Research Institute, Budapest)

THE ECONOMIC CONSEQUENCES OF LENGTHENING THE AVERAGE LIFE SPAN

Between 1948/49 and 1959/60 in Hungary the average length of life characterizing the mortality pattern of the total population increased from 61,01 years to 67,35 years. During the same period the sizes of some economic phenomena produced during the average duration of life increased similarly considerably, first of all, as a result of the changes in their age-specific intensities and sizes resp. It can be proved that solely the improvement of the mortality pattern and the resulting increase of the average length of life would increase the length of the economically active life during the average length of life by 3,11 years (by 11,4 per cent), the length of the economically inactive life by 3,23 years (by 9,6 per cent) the working time by 6483 hours (by 11,3 per cent), the non working time (leisure time) by 49056 hours (by 10,3 per cent), the production by 46,8 thousand Forints (11,5 per cent), the consumption by 36,2 thousand Forints (by 10,7 per cent) and the excess of production surpassing consumption by 10,6 thousand Forints (by 15,6 per cent) under the conditions of 1959/60 as compared with the conditions of 1948/49.

The average duration of life and the sizes of the economic phenomena produced during the average duration of life can be conceived as the weighted arithmetic means of the average lengths of life and the average economic performances of those who died due to different causes of death. This conception enables us to study the different methods of the hypothetical elimination of the different causes of death and its economic effects.

The so-called economic life tables by causes of death for 1959/1960 supply interesting evidence; it is apparent from them that the hypothetical elimination of the mortality resulting from the ten causes of death studied would increase – nearly without exception – at first, the length of the economically inactive life, secondly, the non-working time (leisure time), thirdly, the total length of life, fourthly, the consumption, fifthly, the length of the economically active life and working time, sixthly the production. The results of computations performed on the basis of the independent probabilities of death by causes show a certain decrease of the excess of production surpassing consumption if the mortality due to illnesses of the circulatory system and the vascular lesions effecting the central nervous system were eliminated.

There are remarkable differences in the percentual distribution of the losses due to the mortality of the total length of life and of economic phenomena within the age interval of the 90–99 years old as well as in the distribution of these losses between the ten groups of causes of death studied. The complete elimination of mortality within the age interval of the 0–99 years old would increase the average expectation of total life at birth under the conditions of 1959/1960 by 48,6 per cent, the length of the economically active life and working time by 20,2 per cent, the length of the economically inactive life by 76,8 per cent, the non-working time (leisure time) by 52,3 per cent, the production by 18,9 per cent, the consumption by 40,9 per cent. In that case the excess of production surpassing consumption would decrease by more than its half but would not disappear and would not turn into its opposite – into excess of consumption surpassing production as it has been thought by some authors without the performance of the necessary calculations.

DEZSŐ DÁNYI
(Central Statistical Office, Budapest)

NATURAL FERTILITY

Applying the so-called family-reconstruction method, the individual inscriptions of the registers render the historical analysis of fertility and mortality conditions of certain generations, cohorts possible.

The report has analysed the fertility data of four villages (Kunszentmiklós, Somogysámson, Bágyog, Nagykovácsi) and those of a town (Győr) from the 18th century by the method mentioned.

Preliminary results have shown that birth control had not been widely practiced at that period. Also the fact has been shown that the fertility of these settlements significantly differ from each other and they do not conform to either of the high fertility rates known hitherto from the times preceding industrial revolution.

JÓZSEF TAMÁSY
(Demographic Research Institute, Budapest)

THE LIFE CYCLE OF ENDOGAMOUS FAMILIES IN THE REGION OF BODROGKÖZ, IN THE 19th CENTURY

The study of the family life cycle is a recent field of research of family demography. From the foundation of a family to its dissolution this cycle can be divided into characteristic stages. The length of the cycle, and within it the length of the different stages highly depend upon different demographic, social, economic and biological factors.

The paper reviews the preliminary results of the study in process which attempts to measure the changes in the life cycle of the families of an endogamous population which has lived in a closed community for centuries. Above all the changes, caused by the long-term implications such as, for instance, the improvement in mortality and in the consequential lengthening of the duration of life, change in the age at marriage, and variations in attitudes towards fertility.

Since 1965 the research workers of the Demographic Research Institute in Budapest and of the Institute for Anthropology at the University at Mainz under the direction of János Nemeskéri and Hubert Walter, have been performing demographic and population-genetical investigations in the region of Bodrogköz to determine the frequency and degree of endogamy and the trends in the choice of mating.

Of the 21 villages studied in the region of Bodrogköz the highest endogamy was experienced at Cigánd (78 per cent), where the overwhelming majority of the endogamous marriages derived from 15 large families. Genealogical tables have also been prepared on these families which have made it possible to delimit the generations and to follow up thereby the development of the family life cycle through 4–5 generations. This is why we have selected as a first step to process the data of Cigánd. It is a temporary deficiency from the point of view of the study that, at present, the genealogical tables contain the male line only.

Of the 15 large families the processing of the data of only 7 families has ended, including 405 families altogether. Surveying the genealogical tables we have considered as first generation families those derived from marriages concluded before 1770, as fifth generation families those derived from marriages concluded after 1870. The ranging is based on the point of time of the first marriage only. In the present stage of study we have disregarded from the analysis of the data of the first generation, based on a very small number of cases.

The average total length of the family life cycle, ie. the average length of marriage completed was 35 years in the second generation, 30 years in the third and fourth generations and 36,5 years in the fifth generation. The average age at marriage among males varies between 23,1 and 24,6 years, among females between 20,6 and 21,8 years. The first child was born, as a rule, in the second half of the second year of marriage, the last child was born in the 17th, 14th and 15th year of marriage of the second generation, third and fourth generations, and fifth generation respectively.

The completed marriage fertility of the second, third, fourth and fifth generation was

6,6, 5,2, 4,4 and 5,5 live births respectively. Infant mortality was falling at an accelerating rate. Of the second generation families 262 deaths among children under one year, while of the fifth generation families 208 deaths among children under one year were recorded per 1000 live-births.

In second generation families reproduction ends in the 38th year of life of the women. In the subsequent generations it occurred uniformly and nearly regularly in the 36th year of their life when less than one half of the length of the family life cycle has elapsed and seems independent of the age at marriage. (The data are somewhat distorted by the presumably underregistration of still-births.) These facts lead to the conclusion that in the families studied possibly at the end of the 18th century the number of births was regularly controlled.

Studies that are planned for the future will make it possible to provide answers to such questions as whether long length of life, long duration of marriage, low age at marriage, seemingly favourable infant mortility, the relatively early termination of childbirths and the supposed application of birth control are characteristic features of endogamous large families only, or derive from ethnic factors, from phenonena connected with regional isolation or from other biological and genetic factors connected with the above. The answers to these questions together with interpretation require the co-operation of the biologist.

RUDOLF ANDORKA
(Demographic Research Institute, Budapest)

EFFECT OF THE SPREAD OF BIRTH-CONTROL UPON THE FORMATION OF THE POPULATION STRUCTURE OF AN ETHNIC UNIT (ORMÁNSÁG)

Family reconstruction founded on a survey of the parochial registers of births, marriages and deaths shows that in certain smaller territorial and ethnic units of Hungary, a marked practice of birth-control appeared much earlier (already at the turn of the 18th and 19th centuries), than supposed up to now. Ormánság is one of such ethnic units. The parochial registers of the villages Besence and Vajszló bear witness of the circumstance that in families the number of children was most efficiently controlled as early as around 1800.

It seems that the condition that fertility in the Ormánság was much below the national average, was caused primarily not by biological factors but by culture (taken in the wide sense) built on the economic fundaments, – more exactly: by ideas of the families about the desirable number of children.

As a consequence of the gradual spread of "egyke" (system of having only one child in a family), population first stagnated, then it began to decrease, and other population, from other – more fertile – parts of the country drifted in its place. As a result of this, the structure – among others the genetical structure – of the population living in the Ormánság today markedly differs from the one prevailing there around 1800.

The historical formation of the population of the Ormánság can furnish an example of how demographic phenomena, and thus the genetic composition of the population, are

influenced by cultural factors. Since even in our days considerable (and not decreasing) differences exist in the fertility of the individual territorial units of the country, which can be in part similarly explained by cultural factors, far-reaching conclusions can be drawn from the investigations as described in the lecture.

KINGA K. ÉRY
(István Király Museum, Székesfehérvár)

THE POPULATIONS OF THE 10–11TH CENTURIES IN PROPORTION TO THE DATA SUPPLIED BY CERTAIN SOURCES

The lecture is an attempt at comparing the estimated number of inhabitants living in Hungary in the 10–11th centuries with the quantity of the excavated anthropological find material, as well as – founded on various publications – with the archeological and documentary data in the areas of a number of counties. The author's aim is to promote a more exact judgement of the conclusions to be drawn from the sources of the said period.

ZSUZSA R. HOLLÁN
(National Institute of Haematology and Blood Transfusion, Budapest)

HAEMOGLOBINOPATHIES RECOGNIZED IN HUNGARY

The study of normal and abnormal haemoglobins is of paramount importance in obtaining a better insight into the research of molecular diseases, the regulation of protein synthesis, the correlation between the structure and function of the protein molecule, and into the evolution of the protein molecule and basic research in genetics, as well. The author reports in brief on (1) three families suffering from α-thalassaemia, (2) a family suffering from hereditary hypersideraemic sideroblastosis, most probably corresponding to α-thalassaemia minor, (3) a new haemoglobin (Hb) mutant causing haemolytic anaemia, (4) three patients and their families suffering from unstable Hb disease, (5) two families with Hb M disease, and (6) two haemoglobinopathies inducing polyglobulia. The changes in the synthesis, structure, stability and function of the Hb molecule were always investigated in correlation with the changes in the structure and function of the red blood cells.

MATILD DOBOS, GYÖRGY FEKETE and DEZSŐ SCHULER
(Department of Paediatry No. 2. Semmelweis Medical University, Budapest)

OCCURENCE OF CHROMOSOMAL ABERRATIONS CAUSED BY CYCLOPHOSPHAMIDE IN NON-TUMOROUS PATIENTS

The literature of recent years deals is an ever increasing measure with chromosomal aberrations induced by various chemicals and drugs; in particular with the agents being applied as medicaments.

The injurious effect of cytostatics to the chromosomes in neoplastic diseases is known; however, even the original disease – malignant tumour, leukaemia – is often concomitant with numerical or structural aberrations in itself, and this does not permit an exact valuation of the results. The introduction of immunosuppressive treatment raised the problem: whether cytostatics, administered in case of nephrosis syndrome, collagenosis and other non-tumorous diseases, cause permanent or but transitory lesions in the chromosomal structure. The fact that these diseases – not likely to the various sorts of malignant diseases – are in most cases not lethal (consequently of significance as regards the next generation), lends this problem a special importance.

In their investigations presented in the paper, the authors examined the data of 9 patients having already undergone immunosuppressive treatment, further those of 5 still under treatment. Among the cases 10 were nephrosis syndrome, 1 subsepsis allergica, 1 Schönlein-Henoch's purpura and 2 chronic glomerulonephritis. The daily dosage of Endoxan was 3–5 mg per kg, excepting the subsepsis allergica case. Treatments lasted for 6 months.

The examinations were carried out in lymphocyte cultures of peripheral blood, upon a cultivation period of 72 hours, according to Moorhead's somewhat modified method.

Previously to the treatment, on the average 1.7 percent of breakage was observed in the cultures. Following 3–4 months of treatment with Endoxan, this value rose to 17.5 percent. 2–4 weeks upon discontinuance of the therapy, breakage was observed in 16 percent of the cells. The evaluation of the remaining cases is under way, and also the assessment of the examinations which are to take place 3 and/or 6 months after therapy is continued.

From the results attained up to now it appears that the percentual frequency of occurrence of chromosomes with structural aberrations is significant even if the treatment with cyclophosphamide has been finished.

JÁNOS LÁSZLÓ
(Department of Gynaecology, No. 1. Postgraduate Medical School, Budapest)

THE SIGNIFICANCE OF DIRECT CHROMOSOME EXAMINATIONS FROM ENDOMETRIUM IN GYNAECOLOGICAL DISEASES

In the course of the author's investigations in the field of gynaecological endocrinology, the elaboration of a method seemed necessary, which permitted (besides a routine chromosome analysis of the leukocytes from the blood) a rapid control and completion. Since endometrium in one of the tissues of the female organism which display the most active disposition for regenerating, the author applied, for the prupose of chromosome examination, mucous membrane obtained by curettage, according to a modified method of Rothfels and Siminovitch. Of a suspension produced from erased endometrium, he made a direct chromosome preparation and a diagrammatic representation of the karyotypes, parallelly with cell preparation according to the method of Moorhead and collaborators.

In the first part of the examinations, he could ascertain, that a chromosome examination equivalent with leukocyte cultures could be performed by a "short term" method in cultures from the tissue of the endometrium. Though the mitotic activity of the cell preparations produced from the uterine mucous membrane was less, than that of the leukocyte cultures, however, direct preparation enabled to avoid the effects concomitant with cultivation damaging the cells. The method affords a possibility to perform simultaneously with diagnostic curettage also a direct human cytogenetical screening test in the gynaecological patients.

In the second part of the examinations, the author could state that in an unselected group of endocrine patients the "short term" method proved suitable for demonstrating mosaicism, mainly in case of its latent forms.

In the third part of the examinations, the author determined, in the blood and endometrium, the karyotypes of patients complaining of primary amoenorrhea, sterility or habitual abortion. He found that in a considerable percentage of these diseases one also had to reckon with a genetical deviation. In the demonstration of the deviations, cell preparations produced from endometrium often have a decisive part.

ZOLTÁN PAPP, SÁNDOR GARDÓ, GÁBOR HERPAY
and SÁNDOR ÁRVAY
(Department of Obstetrics and Gynaecology, Medical University, Debrecen)

PRAENATAL CYTOGENETIC INVESTIGATIONS AND THEIR SIGNIFICANCE IN HUMAN BIOLOGY

1. Investigation of amnial cells

It has been known since 1956 that conclusions to the sex of the intrauterine foetus can be drawn from the sex-chromatin content of exfoliated cells of foetal origin; 10 years later even the cultivation and chromosome examination of these cells became feasible. Praenatal determination of sex has a significance in the screening of hereditary diseases bound to sex (e.g. haemophily, muscular dystrophy, etc.,). Depending on the results of the latter, the interruption of gravidity with a foetus of undesired sex can be considered. Moreover, by means of praenatal chromosome analysis not only an early determination of sex, also the screening of various chromosomal aberrations (e.g. D/G translocation, etc.) could be possible by now. In order to judge the reliability of the method, the authors carried out amniocentesis and cytological analysis in 130 early gravidae reporting for artifical abortion. Relying on their findings, the method can be applied in the work of genetic counselling. For obtaining amniotic fluid, transvaginal amniocentesis seems to be the most practical method, the optimal period of the intervention is between the 14th and 16th weeks of the gestation.

2. Investigation of aborted foetuses

The cytogenetic examination of spontaneously aborted foetuses has been resulted in nearly a quarter of abortions numerical or structural chromosomal aberrations.

An analysis of the results attained by the authors up to the present points to the circumstance that chromosome disorders occur at a considerably higher frequency in cases of spontaneous abortion, than in the material obtained in the course of induced abortions of healthy gravidae.

The clinical significance of this observation lies – in the authors' opinion – partly in the fact that thratened early abortions of genetically pathologic embryos might be prevented by means of the widely used medicamental therapy, and so kept alive a defective individual, partly in the suspicion that the risk may even be increased by these drugs (hormone preparations, sedatives, etc.), the teratogenous effect of these seems. As a practical consequence of this conclusion, the authors do not justify the infense medicamental therapy of the early threatened abortions.

PÉTER RUZICSKA and ENDRE CZEIZEL
(National Institute of Public Health, Budapest)

CYTOGENETIC ASPECTS OF PRAENATAL MORTALITY

The rate of foetal mortality is rather high: about 30–35 percent of pregnancies are interrupted in the form of spontaneous abortion or of inapparent pregnancy. About 25 percent of spontaneous abortions can be ascribed to chromosomal abnormalities. Generalizing the literary data on foetuses aborted mainly in the first trimester and their own data regarding foetuses aborted in the second trimester, the authors suppose that praenatal chromosomal-genetic selection can be divided into at least three phases. These correspond to the peaks of the praenatal mortality curve. The distribution of the types of chromosomal abnormalities is characteristic of the individual phases. In the first of the said phases, which corresponds to the so-called inapparent pregnancies, the death of the foetus is induced probably by autosome monosomies, trisomies of the larger autosomes and unbalanced structural abnormalities. In the second stage, corresponding to the foetuses aborted during the first trimester, X chromosome monosomies, trisomies of the smaller autosomes and polyploidies occur mainly in pure form. In the third phase, which corresponds to the foetuses aborted during the second trimester, the death of the foetuses is caused primarily by X chromosome monosomies. Both appearing mostly further autosome trisomies, in mosaic forms, as well as more or less balanced structural abnormalities.

JÓZSEF SCHLAMMADINGER, ISTVÁN VAJDA
and GÁBOR SZABÓ
(Biological Institute, Medical University, Debrecen
and Department of Internal Medicine No. 1, County Hospital, Debrecen)

THE DIFFICULTIES IN THE PEDIGREE ANALYSIS OF INFREQUENT INHERITED DISEASES (IN CONNECTION WITH A CASE HISTORY)

In the introduction the authors analyse the limits of human genetic examinations and examination methods. They briefly summarize their data acquired on the pedigree of a patient suffering from ichthyosis vulgaris. The data are indicative of a sex-linked form of inheritance.

They complete the obtained information with data found in the pertinent literature, and reported on the same family 40 years earlier. (At that time the form of inheritance was similarly found to be linked with sex.) They compare the results of the pedigree analysis with the clinical and histological findings, which correspond to a form of the disease with autosomal dominant inheritance.

In the discussion they deal with the questions of penetrance and expressivity, the role of genetic and external environmental factors in the manifestation of the disease.

Differences of the manifestation between the two sexes may be looked upon as different realization of genetic and assortative environmental factors. Founded on their findings, they presume the possibility of a sex-limited autosomal dominant inheritance.

In conclusion, considering the data of the literature and their own case, they discuss the varying character of the clinical picture, compare ichthyosis vulgaris with other ichthyotic changes, and raise also the possibility of a common multifactorial mode of inheritance of the various types of ichthyosis involving ichthyosis vulgaris.

LÁSZLÓ KLUJBER
(Department of Paediatrics, Medical University, Pécs)

URINARY EXCRETION OF GLYCOSAMINOGLYCANS IN SAMPLES OF HEALTHY AND MENTALLY DEFICIENT POPULATION

On the metabolism of glycosaminoglycans indirectly usable data can be obtained by analyzing the compounds excreted with the urine. The quantity and the qualitative distribution of the glycosaminoglycans fractions in the urine can be well applied for examining the effect of some genetic and other factors. The author reports on the examination of two factors:

1. With a view to study the changes ensuing as consequences of the age of life, the GAG excretion of about 150 healthy persons between three days to eighty years of age was examined. The distribution of excreted hyaluronic acid, heparan sulphate keratan sulphate, chondroitin 4-sulphate, chondroitin 6-sulphate, dermatan sulphate in neonates, infants, children, adults, and old people proved to be characteristically different.

2. Part of the mucopolysaccharidoses is accompained by mental deficiency. For this reason the author examined the frequency of pathologycal excretion in 600 children of various stages of mental deficiency. Using a screening test, 44 children were found to excrete high amounts of GAG. The distribution of the various fractions was analysed in these persons. Mucopolysaccharidosis was identified in seven cases. [3 persons type I (Hurler); 1 person type III (Sanfilippo); 3 persons type IV (Morquio)].

HUBERT WALTER and JÁNOS NEMESKÉRI
(Institute of Anthropology, Johannes Gutenberg University, Mainz and Demographic Research Institute, Budapest)

TO THE POPULATION GENETICS OF THE NORTH-EAST HUNGARIAN AREA BODROGKÖZ

The authors report on their population-genetic investigations in 1774 individuals from various localities of the Bodrogköz, carried out in 1965/66. The population of this area was, in consequence of geographical causes, for a considerable time dismembered into a series of subpopulations, and the drift of genes having taken place among them was but slight. This could be proved by the demographic analysis of parochial registers and deeds of the registrars' offices, – at least as regards the time from 1748 on.

Serological and genetic examinations on the systems ABO, MNS, Rh, P, Kell, Duffy (a); haptoglobin, Ge, Gm, Inv and Lp indicated that phaenotype- and gene distribution displayed in this geographically isolated area an in part highly marked inhomogeneity, which, in the majority of cases, could be statistically proved. This regional inhomogeneity of distribution is interpreted as follows: local differentiation in the genetic population structure, as possible in consequence of genetic drift, variable intensity of selection, etc., became fixed by a more or less marked isolation of the individual subpopulations, and could, therefore, be preserved up to the immediate present. This explains the role of geographical isolation of human populations in the genetic differentiation and thereby in the processes of micro-evolution also within small, limited areas.

LOTHAR SCHOTT
(Department of Anthropology, Museum for Natural History, Humboldt University, Berlin)

WHETHER THE EFFICIENCY OF ENVIRONMENTAL INFLUENCE ON THE ABILITY TO TASTE PTC CAN BE STATISTICALLY DEMONSTRATED

Among the examinations regarding the ability to taste PTC, the works dealing with the peristatic influencing of perception of the taste of PTC deserve special attention. In his comprehensive work, Jörgensen is of the opinion that, after the distribution of the PTC

phaenotypes into smokers and non-smokers, the question is sufficiently cleared up. He assumes that no statistically significant connection can be demonstrated between the continuous habit of smoking and the ability to taste PTC. In this regard he founds himself on data of Falconer, Pons, da Cunha and Abreu, Akesson, Saldanha, Freire-Maia and Quelce-Salgado. The surveys of Kacsur and Schott suggest, however, the presumption that continuous smoking could be of influence in the perception of the taste of PTC. The data of the individual examinations, compiled in a table presented by the author, as well as the comprehensive values for the two sexes and for the sum of all examined probands indicate that, at the present state of the examinations, no decisive opinion can be formed. Whether ethnic differences can be involved when examining the differing data, has to remain as yet undecided.

GOTTFRIED KURTH and ELLEN WEBER-OLDECOP
(Seminary for Anthropology, Technical University, Braunschweig)

POPULATION-BIOLOGICAL EVALUATION OF THE OLDECOP GENEALOGICAL TABLES

The genealogical tables include the period 1375–1875, with 14 generations of well 35 years. 533 individuals are dealt with, of them 210 ♂ and 149 ♀ Oldecops, as well as 72 ♂ and 102 ♀ related by marriage. The family originates from Hildesheim, and belongs, with its discussed branch, to the upper middle classes (alone academicians are 423 in number among them). At marriage, the social circles were strictly observed. The family is early protestant. Marriages are contracted among others with French, Baltic, Swedish and Russian women, – the family extends from Archangelsk to Bordeaux.

The number of children per marriage amounts to 3.87 on the average, being somewhat higher than the value of 3.7, prevailing in South Lower Saxonia; the number of children of the academicians is at 5.26. Mortality within the period up to the 40th year of life attains only 15.5 percent, it is 47.7 percent in South Lower Saxonia. With about 30 years in 0– ♂ and about 25 years in 0– ♀, the age at marriage is somewhat below the values of South Lower Saxonia. Only 33.4 percent of all newborn come to a marriage, with the Oldecops this value is 66 percent. This indicates that the reproduction rate of the Oldecops is nearly two times higher than the average in South Lower Saxonia. The same applies to a peasant branch of the Oldecop family from the Kalenberg area. The middle-class Oldecop family yields thus a remarkable example of favourable conditions of selection, which should be considered with particular emphasis at the interpretation of average values for the explanation of complex conditioned selection processes.

DEZSŐ HATTYASY and EMIL WALLNER
(Department of Stomatology, Medical University, Szeged and Central Stomatological Institute, Budapest)

ANTHROPOLOGICAL VARIATIONS OF DENTITION IN A RELATIVELY ENDOGAMOUS POPULATION

As members of a complex anthropological co-operative under J. Nemeskéri's direction the authors examined the dentitions of 377 and/or 256 individuals belonging to the Ivády family, at two occasions, with 10 years difference, in 1951 and 1961/62. This time merely the already developed dentitions of 4 clans are dealt with.

As to the variants of the dental arches: in single individuals of the four clans examined no marked differences appear, while one or the other variant comes to dominance in single groups within the clans. Thus, in the bialos-clan, the wide paraboloid upper arch with a slightly declivous palate is met with, in the dávid-clan a broader ellipsoidic arch with a hollow palate, in the lászló-clan a greater size of the arches and a more regular and better-developed lower arch can be seen. In a part of the sulyok-clan the large frontal arch and/or an inclination to angularity (the latter is to be attributed presumably to marriages with persons from the neighbouring villages), in an other a small, narrow upper arch and a deep, vaulted palate are characteristic.

In this way so-to-say family characters are forming and become characteristic regarding both the arches and the palatal configuration.

LÁSZLÓ HORVÁTH and DÉNES MARGITAY-BECHT
(Department for Pathological Pregnancy, Schöpf-Merei Ágost Hospital and Maternity Care Centre, Budapest)

DATA CONCERNING THE SEXUAL LIFE OF MARRIED COUPLES COMPLAINING OF RESULTLESS PREGNANCY

In the course of a genetic survey of the 500 cases presented at the Department of Pathological Pregnancy of the Budapest Maternity Care Centre in the past 3 years, and selected with respect to the complaint as indicated above, the authors compiled the following data (1) and, having carried out statistical calculations (2), they arrived at the results (3) as set forth below.

1. Collected data:

a) time of the appearance of the first menses (years of age).

b) Beginning of regular, extra- or intramarital sexual life; in the wife's respect (years of age).

c) Time elapsed between the first menses and the beginning of regular sexual life (years).

d) Frequency of sexual intercourse (number per months).

2. Calculated statistical values:

a) $\bar{x} = 13.48$; $s = 1.98$; $s_x = \pm 0.08$; min.: 10 years, max.: 18 years.

b) $\bar{x} = 20.72$; $s = 3.17$; $s_x = \pm 0.14$; min.: 15 years, max.: 39 years.

c) $\bar{x} = 7.23$; $r = +0.29$; $t = 0.013$; $P > 0.50$

d) Factors influencing the frequency of coitions:

– the wife's age: 20 years old: $\bar{x} = 14.8$ per month → 35 years old wife: $\bar{x} = 9$ per month;

– the husband's age: 22 years old: $\bar{x} = 17.5$ per month → 40 years old man: $\bar{x} = 8$ per month;

– duration of married life: 1 year: $\bar{x} = 15.5$ per month → 17 years: $\bar{x} = 6.5$ per month;

– difference of age between husband and wife 0 → 10 years (if the husband is older): $\bar{x} = 11.4$ per month; $s = 0.97$; $s_x = \pm 0.29$ (min.: 10.6 per month, max.: 12.8 per month);

– 1 → 10 years (if the wife is older): $\bar{x} = 14.8$ per month; $s = 7.0$; $s_x = \pm 2.18$ (min.: 6 per month, max.: 28 per month).

3. Valuation:

a) The time of the first menses does not differ from the European average.

b) The time of beginning regular sexual life supposes a certain maturity of individuality the average value is, namely, above the age of 20.

c) The frequency of coitions decreases parallelly with age and habit, however, it is not influenced by the difference in age between hunband and wife.

TIBOR TÓTH

(Anthropological Department, Hungarian Natural History Museum, Budapest)

ON THE IMPORTANCE OF THE ANALYSIS OF MORPHOLOGICAL MODIFICATIONS IN PALEO-ANTHROPOLOGY

In recent years the author devoted increased attention to the analysis of morphological modification and to the effectivity of the methods at disposal. He examined the 43 series deriving from the chronological periods between the Upper Paleolithic and the beginning of the Neometallic, published by himself and other authors. It should be noted, that these finds have been excavated in the subtropical and moderate climatic zones of the Eurasian continent. Relying on the comparative evaluation a possibility is presented to differentiate, by using new methods, the morphological properties, character-groups and components of the subtropical (Proto-Mediterranean) and moderate (Proto-Europoid) climatic-zone series.

ISTVÁN KISZELY

(Institute for Archeology of the Hungarian Academy of Sciences, Budapest)

THE LOMBARD MAN

The author has examined a population in time and space. While the anthropological examination of the individual sites affords valuable details, the examination of all sites

(about 1000 finds from 26 cemeteries) of a population, carried out by one person and from a uniform aspect, also serves with information on the ethnic amalgamation of a people, of its anthropological appearance and changes in health. Beyond examinations of historical anthropology, the author also deals with the origin of the population mentioned above (Germany or Scandinavia), with its absorption and/or survival in Italy, and endeavours to draw a parallel between the evidence given by contemporary written sources, works of art and grave findings.

IMRE LENGYEL and JÁNOS NEMESKÉRI
(Institute for Archaelogy of the Hungarian Academy os Sciences, Budapest and Demographic Research Institute, Budapest)

ANALYSIS OF THE STRUCTURE OF A 9TH CENTURY POPULATION, RELYING ON THE LABORATORY- AND MORPHOLOGICAL EXAMINATION OF ITS SKELETAL FINDS

The population of the 9th century cemetery excavated at Sopronkőhida constitutes a closed ethnic unit. Careful excavation and the completeness of the material enabled a demographic, anthropological and palaeo-biological reconstruction of the population. Relying on the archaelogical and anthropological characteristics, three groups (great families) and three generations can be distinguished within the population. The population determined by Avar-Frank-Slav archaeological finds covers a surviving Avar ethnic group. The anatomical variations served with excellent opportunities: founded on their examination, namely, the genetic sequence and connection within the three great families can be proved.

Serological and laboratory examination jointly permit to elaborate reconstruction at a high level.

Comparing the results of the complex chemical-analytic, serological and histological investigations carried out in the bone finds of the Sopronkőhida cemetery, with the archaeological and anthropological characteristics of the population, founded on three-direction examinations, the authors outline the biological structure of the population of the cemetery.

The laboratory analysis of the tissue samples from the skeletal finds also permit to determine the relative chronology within the cemetery. This corroborates the statement of archaeology regarding the population of the cemetery under discussion. Over and above this, the comparison carried out on this basis shows a significant agreement between the biological characteristics of one of the population groups of the Sopronkőhida cemetery and those of the Sopron-Hátsókapu "Frank-family".

EDIT LOTTERHOF, ANTÓNIA MARCSIK and PÁL LIPTÁK
(Department of Anthropology, József Attila University, Szeged)

CHANGES IN POPULATIONS OF HUNGARY FROM THE 10TH TO THE 16TH CENTURY

The aim of the lecture is to characterize the changes of the populations, taken place over 7 centuries, founded in the first place on the works of the three authors published recently, those in press and/or in manuscript. The part of Pál Lipták's comprehensive synthesis falling to the period between the 10th to 13th centuries serves as a comparative basis for the lecture.

In its further parts the lecture relies on the following anthropological finds and series from authentic excavations grouped by ages:

10th century: Nádudvar–Töröklaponyag, Aldebrő–Mocsáros, Békés–Povádzug, Hódmezővásárhely–Nagysziget, Kübekháza–Ujtelep, Szabadkígyós–Homokbánya, Szabadkígyós Pál-ligeti tábla, Szarvas–Ószőlő, Szarvas–Tessedik-út.

11th–13th centuries (some series among these also extend to the 16th century): Téglás–Angolkert, Békés–Povádzug, Kardoskút–Fehértó, Baja–Pető.

15th–16th centuries: Röszke–Kószó tanya.

The lecture devotes particular attention to the microevolutionary processes of brachycephalization and gracilization.

OLGA L. BOTTYÁN
(Anthropological Department, Hungarian Natural History Museum, Budapest)

CHANGES IN THE PALATE OWING TO AGE

The lecture presents the summary of the researches into the changes connected with the development of certain characteristics observed in the course of examination of the palates of round 1000 6–16th century skulls from sites in Hungary.

The examined characteristics are partly measurements and their connection (lenght, width, index, depth, length of the spina nasalis posterior), partly descriptive characters (form of the dental arch, of transverse palatine suture, measure of ossification of the incisive suture, degree of development of the torus palatinus). The mathematical interpretation of these latter is less reliable, owing to the subjectivity of the examination methods.

The developmental change of the examined characteristics is greatest in the infant- and juvenile age-groups, of greater degree and generally of opposite tendency in the senile group. On the other hand there is actually no change in the adult- and mature age-groups.

The selection of the palate characteristics which are of greatest efficiency in age determination was realized by a workable mathematical task.

GYULA FARKAS
(Institute of Anthropology, József Attila University, Szeged)

A SURVEY OF THE ANTHROPOLOGICAL ASPECT OF A VILLAGE IN THE SOUTHERN HUNGARIAN PLAIN (TÁPÉ) BY MEANS OF DEMOGRAPHIC DATA

The author reports on the results of an ethnic anthropological examination of the village Tápé, inhabited since the Neolithic, disposing of written documents since 1138.

He finds that the extraordinarily tradition-bound inhabitants have preserved above all the Alpine, Pamirian, Armenoid, Lappid and Cromagnoid elements (as defined by Lipták's taxonomic system). Mongoloid and Dinaric characteristics are observable to a lesser degree.

Besides the anthropological characters, he also worked up the data of marriages, births and deaths from 1805 to our days. He appraised the demographic changes, relying on a percentual rate, by months, decades and 1000 inhabitants.

He found that the connection between the monthly distribution of marriages and births was determined in the first place by the economic situation of the village. For the period between 1805 and 1960 he determined the natural increase of the population in 4093 persons. Taking into consideration the number of inhabitants, he ascribes the growth of the population of the village chiefly to natural increase. Relying on the examination of demographic data and family names, he comes to the conclusion that the community, situated rather near to the city Szeged, has fairly preserved its social independence, for which reason the amalgamation of the inhabitants has been of small measure.

He takes stand in favour of the demand that, besides the biological phenomena, by all means also the demographic relations should be taken into consideration in ethnic anthropological examinations.

ANDRÁS KELEMEN
(Hungarian Neurological and Psychiatric Hospital, Budapest)

POPULATION-GENETIC DATA OF SÁRRÉTUDVARI

The author has examined 353 adults in this endogamous village in anthropometric, morphological and genetic respect. The present lecture deals with the following characters: 1. The author found the rate of dyschromatopsia to be significantly above the Hungarian average, and this actuates the examination of other characters located near on the X chromosome. 2. Relying on dermatoglyphic examinations, the distribution of finger-pattern types essentially fits in among the results attained so far. (Intensity of patterns: ♂♂ = 12,6 and ♀♀ = 12,5). 3. Examination of middle-phalangeal hair: in population-genetic respect the occurence of individuals without middle-phalangeal hair comes closest to the data reported on the Kún (Cuman) populations. Occurrence index

by sexes: 1,11. Number of fingers with hair on the middle phalanges is 1,58–2,64. The genetic picture is dominated by the typical combinations. 4. The occurrence of the simian crease presents a value higher than the recent Hungarian data, and this points to pathological respects. The author conducts pioneering investigations regarding the relative lenght of fingers and toes, hand-clasping, form of the ear-lobe, burring of the consonant "r" and as to the existence or absence of the musculus palmaris longus. In these field he calls attention to the following results: the IInd finger is longer than the IVth (= less frequent variant) more frequently in women than in men; the hallux is shorter than the IInd toe, this similarly occurs more frequently in women. As regards hand-clasping, the author intends to contribute to the question of genetic determination with examinations on interlocking.

OTTÓ EIBEN
(Institute of Anthropology, Eötvös Loránd University, Budapest)

EXAMINATION OF THE VARIATIONS OF THE FEMALE PHYSIQUE

One of the main concerns of physical anthropology (and also of human biology) is the research into individual variation and differentiation: a field of the latter is the examination of physique. As research conducted up to now concerned men in the first place, the author examines female physique in his lecture.

He performed detailed anthropometric analyses concerning the most outstanding women-athletes of Europe (N = 125), the female students of the Physical Education College of Budapest (N = 139) and of the Teachers' College of Szombathely (N = 179). The woman-athletes he grouped by branches of athletics and applied the subgroups as models. He calculated the usual parameters for the lenght measurements of the body, for the width measurements of the trunk, for the circumference of the trunk and limbs, as well as regarding the proportions, relative measurements and indexes of the body, and examined the correlations. He attempted, further, to break down the body measurements of the examined persons to "normal components" easy to manipulate by computation techniques, which have an anthropometric significance independently of each other. The separation of six normal components proved sufficient to permit the production of the body-measurement vectors of the examined persons, as a linear combination of the normal components, at an exactness necessary in anthropometric examinations.

Normal component I., determined by means of a special, so-called diad-separation method, reflects the general data of the examined persons, its coefficient referring to the examined persons can be the general index of "size". Normal component II. indicates the deviation from the average body measurements, its coefficient refers to the morphological appearance of the body, while normal component III. supplies with information on the secondary differentiating measurements, its coefficient tells about muscularity. The representation of normal components II. and III. in a planar system of co-ordinates assigned the individuals of the examined groups to points of well-separable regions. The constructed elliptic regions of standard deviation present a graphic view of the results yielded by the examinations.

ZIVOJIN GAVRILOVIČ
(Institute of Human Biology, Medical Faculty, Novi Sad)

CERTAIN SOMATIC MEASUREMENTS OF SERB AND HUNGARIAN CHILDREN OF MOL

The author examined a group of 916 children of Mol, between 7 to 15 years of age, among them 298 Serb and 618 Hungarian ones. The examination comprised: stature, weight and medium mamillary perimeter. The numerical data were arranged by means of calculating the types of standard deviation. The differences of the averages were calculated according to Student's test. It was found that the Serb boys aged 7 and 12 were taller than the Hungarian ones of the same ages, and that the Serb girls were taller only at the age of 13. There were no differences between the examined children as to weight, excepting the Hungarian boys of 14, who weighed more than the Serb ones of the same age. The medium mamillary perimeter was greater with Serb boys aged 12, than with the Hungarian ones, and situation was the same with Serb girls of 8.

Rohrer's index in the boys aged 7, 8 and 14, as well as in the girls of 13 and 15 displays the advantage of the Hungarians. Pignet's robustness index shows a decreasing tendency with age in all children, and this corresponds to an improvement of constitution. At 8 and 14 years of age, Pignet's robustness index is significantly lower with Hungarian than Serbs.

Apart from the differences already stated, the obtained results point to a great similarity which is an evident consequence of adaptation to the conditions of life within the same country.

MIKLÓS FEHÉR
(Budapest)

THE EFFECT OF ENVIRONMENT UPON BODILY DEVELOPMENT

In the past decades continuously more intense examinations have been conducted regarding the growth of children; the stages and rythm of their development, the hereditary and environmental effects, the cause and measure of acceleration have been studied. Also in Hungary several valuable local investigations were carried out. In the course of his studies extending over the whole territory of the country, the author examined 103,911 individuals of 0–25 years of age, and stated the pertinent norms of growth. In this lecture he presents the effect of the surroundings and of urbanization on the bodily development of the 14–18 years old, founded on the examination of 22,831 Budapest-, 31,637 small-town- and 36,580 village children. Among the Budapest children, he examined bith those living in the centre of the city and those of the outskirts. Towns are represented by 12 Lowland-, 6 Transdanubian and 4 Highland ones. Among the villages every major regional unit is represented from the Szamoshát to the Göcsej, and from the Highlands to Bácska. Besides those mentioned above, the author elaborated the data of infants under care in day nurseries separately. The metric data he assembled into

half-yearly and yearly age-groups. The characters of the small children he also presents arranged into trimestrial and monthly age-groups. The subject of the lecture is in the first place the conclusions to be drawn from the parameters of body – weight and – height.

TIBOR RAJKAI
(Déri Museum, Debrecen)

THE EFFECT OF URBANIZATION ON THE BODILY GROWTH OF SCHOOLCHILDREN

The author repeatedly conducted examinations in two villages: in Téglás (Hajdú-Bihar county) in 1953 and 1963, as well as in Hajdúsámson (Hajdú-Bihar county) in 1951 and 1961. Besides these he also carried out two vertical surveys from 1951 to 1961 and 1961 to 1969. He found that in 1951 and 1953 backwardness was considerable, both in economy and in culture (in the first place in Hajdúsámson). In the 10 respectively 18 years passed between the beginning and the end of the two horizontal examinations and of the vertical examinations a great economical and cultural progress could be observed in both villages. Parallelly with this also the bodily growth of the children showed a more rapid pace in both villages, but mainly in Hajdúsámson. In the elementary-school children of the two villages the mean values of body-height and horizontal measurements showed a 5–10 percent rise, the averages of body-weight a 15–20 percent one since the first examinations. Thus, contrary to similar data of other authors, not only an extension, an increase of body-height is to be met with in the author's material, also the increase in width and weight seem proportional with the former. It is open to question whether this means a discontinuance of retardation, or an acceleration interpreted generally.

GYULA GYENIS
(Institute of Anthropology, Eötvös Loránd University, Budapest)

RECENT DATA TO THE OCCURRENCE OF MIDDLE-PHALANGEAL HAIR IN POPULATIONS OF HUNGARY

The frequency of the presence or absence of middle-phalangeal hair – as a hereditary character – significantly differs in the various populations. The author examined the occurence of hair on the middle-phalanges in four Hungarian populations of different origin (Áporka, Kiskunlacháza, Pereg and Dömsöd), in altogether 889 children between 7 to 14 years of age. He compared his findings with the results of other Hungarian and foreign examinations and controlled the differences with the x^2-test. His results can be summarized as follows: 1. Difference in age: in the examined populations there is no significant difference between the groups of the 7–10 and 10–14 years old children as regards the occurrence (and/or absence) of middle-phalangeal hair (uksz), neither in the frequency of the simpler (III, III + IV) and higher (III + IV + V, II + III + IV + V)

combinations. 2. Difference of sex: in Áporka, Kiskunlacháza, Pereg, Dömsöd, Karcag and Derecske there is no significant difference in the frequency of uksz between the two sexes, however there is one in Jászberény. 3. Difference between populations: in men there is no significant difference in Áporka, Kiskunlacháza, Dömsöd, Jászberény and Derecske, – Karcag, however, significantly differs from all populations (excepting Áporka). In women there is no significant difference between Áporka, Kiskunlacháza, Pereg, Dömsöd and Derecske – however, Karcag and Jászberény (excepting each other) significantly differ from all the others. 4. Difference between the right and the left hand is significant in neither of the populations. 5. The order of frequency of uksz by fingers is IV → III → V → II in all populations. 6. The order of frequency of the combinations of uksz: in general, there are differences to be found in the four populations regarding both the two sexes and the right and left hands. Summarizing the combinations, one obtains the following order of frequency in the four populations: III + IV – III + IV + V – IV – II + III + IV + V – IV + V – III – II + III + IV. This also shows a difference from Jászberény, Karcag and Derecske. 7. The frequency of individuals without uksz: in Áporka (31.0 percent), Kiskunlacháza (27.7 percent), Pereg (30.6 percent) and Dömsöd (30.7 percent), it displays similar values to those in Derecske (29.2 percent), on the other hand, it significantly differs from those in Jászberény (37.6 percent) and Karcag (47.0 percent).

KATALIN MOLNÁR SZILÁGYI
(Institute of Zoology and Anthropology, Kossuth Lajos University, Debrecen)

ANTHROPOLOGICAL EXAMINATIONS IN MENTALLY DEFICIENT CHILDREN

The problem of developmental abnormalities and various deficiencies is coming more and more to the centre of interest in our days. As mental retardation is one of the most general common symptoms of these, the author has conducted her examinations in institutions for the education of backward children and in children's medical homes.

Her intention was twofold: 1. She strove to find an answer to the question, whether mental retardation was accompanied by somatic retardation, and to what degree? 2. What changes were brought about in the skin-lath system by damages of the nervous system?

She measured 529, 6–18 years old defective children with Martin's technique, and took their finger- and palm-prints. She worked up 14 measured and 12 calculated characteristics, and compared them with those of groups of normal children of the same age. She stated significance with F- and t-tests. Deviations were not in each case significant, however, in each longitudinal and head measurement, the curve of the means was below the normal curve. No unequivocal difference in the averages could be found by the degree of gravity of the conditions, – on the other hand, standard deviation and range were highest in the idiots and, as regards origin, in the hereditarily deficient ones. In the

skin-lath system, the most frequent pattern was the ulnar loop, however, arches and whorls were more frequent with the deficient individuals, than in the control group.

As a conclusion it can be stated that mental retardation involves retardation in growth and changes in the skin-lath system.

LAJOS MOLNÁR
(Ophthalmic Department, County Hospital, Debrecen)

CHANGES OF REFRACTION IN THE COURSE OF LIFE

The change in the value of refraction is connected with the development of the eyeball, and therefore it can be understood as a phenomenon of growth. Having measured the refraction of 84 prematurely born and 81 newborn infants, the author found it to be +3.84 ± 2.75 and+3.2 ± 1.53 dioptres. Following birth, the decrease of hypermetropia and the shift-over of refraction toward emmetropia begin. Relying on the examination of the total population of 2084 persons of the village Ujléta, refraction at the age of 6 months was +2.78 ± 1.9 dioptres, of 1 year + 2.65 ± 1.47 dioptres, of 2–3 years + 2.54, of 4–7 years + 2.39 dioptres, of 8–10 years + 1.81 dioptres, of 12 years + 1.15 dioptres, of 15–20 years + 0.91 dioptres. The yearly average refraction values were compared by means of the two-sample Student's test for the first and second decennia. The author found that the values of the 2nd decennium were much lower than those of the 1st. Deviation from the average was rather small: 0.22. On the other hand, decrease observed in the 1st decennium is 0.18 on the average, per year. Also the regression line: $y = -0.18x+2.47$ referred to this. Although during the 2nd decennium the decrease was still going on, this could also be the result of chance. It is well within the limit of dispersion: $y = 0.06x + 1.04$. From 1 to 10 years of age, there was an intense negative connection between the distribution by dioptres of the examined persons and the increase of age. The correlation coefficient was –0.6. Between 11 and 20 years of age this correlation was already 0. Relying on these findings it can be stated that in the majority of cases the change of refraction toward emmetropia is ended in the 1st decennium. Between the 10th and 40th years of age average refraction is approx. the same (+0.91 –1.3 dioptres). Up to the age of 65 a hypermetropization period, beyond that a myopization period ensues.

Section "B"

LÁSZLÓ OROSZ and TIBOR SIK
(Institute of Genetics of the Hungarian Academy of Sciences, Budapest)

THE GENETIC MAP OF RHIZOBIUM PHAGE 16–3

Different mutants of the temperate phage 16–3 of Rhizobium meliloti were isolated after mutagen treatment. The temperature-sensitive (ts), thermo-inducible (ti) and altered plaque morphology (6, N_2), host-range (h), antigen-character (Ant^-), as well as lysozyme-producing (1^-) mutanst were classified by complementation and then crossed. The distance between mutant sites was determined from the frequency of recombinants. By this technique the genetic map of the phage was constructed. With the thermoiducible mutants, the repressor protein was shown to be the thermosensitive point. The functional identification of the altered genes in temperature-sensitive mutants is in progress.

The crosses were analyzed in selective, semi-selective and non-selective systems, according to the recombinants studied. Wild-type recombinants can be selectively detected at 36°C, when the parents are ts mutants. Similarly, lysozyme-producing phages can be distinguished from 1^- mutants in a progeny.

In the semi-selective system one parental type and one recombinant were selected by changing the conditions. Usually ts mutants were chosen as partners in the cross, because at higher temperature these can be eliminated from among the recombinants. Mutants in h and C genes were mapped in this way. The presence of h alleles was determined by changing the host bacteria.

In a non-selective system, parental types and recombinants cannot be separated by changing the conditions. In this case phages of different plaque morphology may be distinguished.

For the study of mutants with changed antigen character another method had to be used, as the phenotypic mixing interferes with the identification of the recombinants. When mapping the Ant marker multiple mutant, ts, C, Ant^- phages were crossed, different types of recombinants were selected, and the antigen character – determined by antiserum – was related to these types.

The following order of genes was determined: (N2 – C, ti) – ts2 – ts6 – ts4 – h – ts5 – (1 – Ant).

According to this genetic map, the non-vegative functions are probably situated on the left arm, whereas genes of morphogenesis on the right side of the chromosome.

JÁNOS BAKOS
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CHROMOSOMAL LOCATION OF SPO1-PHAGE RESISTANCE MARKER OF BACILLUS SUBTILIS BY TRANSDUCTION

A new subtilis phage (MTP1) with high general transducing activity was isolated from the soil. This activity was proved by DN-ase treatment and by the application of anti-phage serum. The restrictivity of the recipient strains for the MTP1 phage is characteristic of the system, so the frequency of transduction can be increased by the multiplicity of infection. This system was used for mapping the marker of the resistance to SPO1 phage.

Various auxotrophs and SPO1-sensitive derivatives of the strain 168 were infected with the MTP1 transducing phage grown on the prototrophic SPO1-resistant strain W23. The prototrophic transductants were counted on Spizizen's MG agar. After the phenotypic expression of the markers tested, the prototrophic and SPO1-resistant, cotransduced bacteria were tested by superinfection with SPO1 phage at high multiplicity (10). The control experiment was carried out by NTP1 phage, propagated on the prototrophic SPO1-phage sensitive W23.

The rate of linkage was characterized by the contransfer index. It was found that the linkage between the SPO1 phage resistance and ade, phe, hisB, trp, met markers was lower than 0.1 percent, whereas the contransfer index for cysB was 1 percent and as high as 25 percent for the hisA.

As the DNA of the MTP1 transducing phage has a molecular weight of about 10^8, and the cotransduction of hisA and SPO1 phage resistance is 25 percent, it is suggested that these markers are located on a single fragment of DNA corresponding to 10^8 daltons.

GÁBOR VIDA
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GENOME ANALYSIS OF CYSTOPTERA FRAGILIS BY MEANS OF HYBRIDIZATION AND INDUCED APOGAMY

The complex of Cystopteris fragilis sens. lat. consists of diploid, tetraploid, hexaploid and octoploid taxa. At least the tetraploid and hexaploid ones, however, contain more than one species (C. fragilis s. str. 4x, 6x – the 8x taxon can be a separate species; C. dickieana 4x, 6x; C. regia 6x; C, diaphana 2x?, 4x, 6x; C. protrusa 2x, 4x). Hybrids were raised between different species of the complex, and their meiotic chromosome pairing was studied in order to detect genetic similarities between genomes involved. In addition, apogamy was successfully induced in the tetraploid C. fragilis s. str., thus, sporophytes with reduced chromosome sets (2x) were obtained, and their meiotic chromosome pairing was studied.

From these cytological analyses it can be concluded, that 4x C. fragilis s. str. is an allopolyploid in origin. The genome of C. protrusa is not included in the tetraploid C. fragilis.

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FLAT AND SPHEROID TYPE OF MAIZE EAR

The tip of the primordium of the normal ear is conical in the early reproductive phase. The cell layers show concentric rings in transversal sections while in longitudinal sections the shape is parabolic. Within the same stage of development, the orientation of the cell division changes in abnormal forms, generally called fasciated. They develop several growing points, the cell-layers form a palm-like arrangement, either in level (with the flat, P11 type) or circular (with the spheroid, P2 type). In the latter form an interior cavity with or without the formation of spikelets is to be found around the wall.

Eleven lines were studied in diallel crosses, including 9 lines with a range of kernel-row numbers between 4 and 20 and P11, as well as P2 ($S > 10$) with kernel-rows of ≈ 22 and/or ≈ 45. Among the progeny of P2, the number of individuals with fasciated ears was much higher than in that of P11. In all but one of the crosses a higher frequency of fasciation was found in F_1 with all P2, whereas with P11 in F_2. Further crosses with one of the 4-rowed and the 17-rowed lines revealed even more remarkable differences between P11 and P2. The F_1, F_2 and Bc progenies of the P2xP11 crosses produced fasciated ears. Plants with normal ears occurred only in 26 among their 72 F_3 populations, however, in low percentage, and this is probably not heritable. The appearance of the fasciated type is greatly affected by environmental factors, and the same plant may bear fasciated and normal ears. The results support the assumption that the two abnormal lines have a common gene, or a few common genes for fasciation.

GÁBOR UHERKOVICH
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TO THE PROBLEM OF THE EUTROPHICATION OF THE RIVERS

A scientific elaboration of the eutrophication of waters, this important question of production biology, has taken place mostly in regard of the dead-waters up to now. Järnefelt's (1952) examinations have shown that the strict categories of "trophity types" are not acceptable in the classification of still-waters. In Thienemann's (1955) opinion, each water can have a more or less markedly presenting eutrophized condition, just the same as a decided, or developing oligotrophic condition. As to the author, the right course is to differentiate between the actual condition of a water and its "type" of trophity, and consider the general picture of the trophity relations of a longer period.

Several authors have already referred to the fact that the actual condition of trophity of a water is shown by certain indicator organisms. Also the condition of rivers may be called eutrophized, as an actual condition, if phytoseston communities of rich population and, at the same time, of variegated composition appear in them. Based on a quantitative analysis to be discussed in full in the paper, 8 phytoseston communities of the Tisza, 3 of the Eastern Main Channel, 1 of Laborc, 2 of the Danube and 2 of the Vistula, each of rich

population, permit the conclusion that the presence in larger numbers of the following microphyta (to be considered, in this regard, as indicators) refers to the actual eutrophized conditions of the rivers of Central Europe: species of Cyclotella, the alga-species Nitzschia acicularis, Melosira granulata var. augustissima, Stephanodiscus dubius, Nitzschia palea, Ankistrodesmus augustus, Scenedesmus opoliensis, Scenedesmus acuminatus and the species of water-fungi Planctomyces bekefii. This indicator-character is to be presumed in some further organisms (Synedra acus, Nitzschia actinastroides, Actinastrum hantzschii).

ISTVÁN KISS
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EXAMINATION OF ALGA MASS-PRODUCTIONS IN ALKALINE SOIL-SURFACES

The author found that in the development of the spotted, mosaic-like character of our alkaline areas the processes of the so-called wellings had a rather significant part. Water flushing out here and there in the dired-out soil surfaces, produces muddy, somewhat protruding spots often markedly coloured by mass-productions of the algae. In the sagging or muddy spots of the wellings it is in most cases Oscillatoria brevis and other blue algae, as well as some green algae or diatoms which call forth mass-productions with "soil-blooming". A new variation of green algae was found in the very surfaces of such wellings. When the wellings have run dry, spots of regradation lighter in colour than the surrounding soil are left, and, in most cases, also the mass-production colouring of the algae vanishes. However, directly under the surface, 1.5–2 mm deep, a dark-green mass-production layer is formed in nearly every instance. This cryptogenous or cryptovegetational form of mass-production is produced sometimes in more than one layer. The substances of the single layers are so much conglutinated by soil-colloids and by the masses of algae that they can be peeled off the salty degradation spots in uniform layers.

These production-biological phenomena, as bio-indicators, point to the circumstance that together with the salts and soil-ingredients, phreatic-water discharge also brings such organic decomposition products to the surface, which stimulate the growth and propagation of the algae. The further study of the phenomena described above can supply valuable data even regarding the origin of alkaline soils.

GYÖRGY MÁNDY
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INCREASING THE QUANTITY OF PLANT FOOD WITH ECOLOGICALLY BASED CULTIVATION METHODS

Greater yields are thought to be attained in the field all over the world by means of cultivating varieties of higher productivity. All this can be done only with small

efficiency, as the effects of environmental factors, especially of the weather, considerably decrease the productivity of the cultivated plant varieties. The only possible way for utilizing the productivity inherent in the varieties is to employ ecologically founded methods which not only preserve the productivity of the varieties but help its realization to a greater extent. Favoruable climatic ecological conditions should be necessary all the more, because adverse climatic conditions make an interaction with in the genotype composition of the variety, and cause its deterioration.

The author carried out investigations on numerous plant species and varieties to recognize the regularities existing in relation to plant populations and climate. A method was elaborated by him for determining the climatic ecological character of the varieties. With this procedure ecologically founded planting- and improvement methods can be determined. The paper is a short synopsis of these ideas and conceptions.

PÁL JUHÁSZ-NAGY
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EXAMINATION OF ZIPF'S LAW IN THE MODEL OF SUPER INDIVIDUAL ORGANIZATION

Zipf's law is that rule of general validity (although of but approximative realization) as regards the "natural" languages, according to which if the words of an adequately long and representative text are marked with numbers of order complying with their frequency, then there is an inverse proportionality between frequency and the number of order (that is e.g. – in a simple case – the word fiftieth as regards frequency is about 1/50 times more frequent than the possibly most frequent one), i.e. $f_k = ck\ \exp(-b)$, where f_k is the frequency of the frequentially k-th word, c and b are empirical constants ($b \approx 1$, or at least $2 \geqslant b \geqslant 1$; c is often of a log-operator character). Somewhat surprising, however, it seems from the author's examinations, that some synbiological phenomena (e.g. the frequency distribution of the individuals in frequencially ranked population categories) can be modelled relying on Zipf's law. Also here the agreement is especially conspicuous regarding the "words" where by "word" a symbol combination florally selected from among the population symbols as stored information is understood and, especially, if line sampling is applied (that is e.g. if in the stand of a plant association a random walk is effected in such a plane that as a result one obtains some symbol sequencies, vulgo "vegetation texts"). However, it is important to note that Zipf's law only valid for certain orders of magnitude – which refer to the magnitudes of topographical sampling – that is, regularly, where the appraised entropy (or neg-entropy) of the finite schemes derived from the frequency distributions is maximal. The paper conteds the interpretability of the results, the connection of the possible interpretation with Zipf's "principle of the least compulsion", Mandelbrot's cost-function theory and, in particular, with regularities referring to the subject in the strict sense of the word (as e.g. the "frequency law" of Rankier, the "principle of geometrical progression" of Motamura, Preston's "log-normal theory", etc.).

KÁLMÁN SZÁSZ and ESZTER SZ. BARSI
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THE ACCUMULATION OF STARCH IN THE LEAVES OF MUTANT PEA PLANTS LACKING CHLOROPHYLL-b

Seybold's theory, that chlorophyll-b played a role in starch synthesis is generally known since the 1940's. The authors have carried out carbohydrate analyses on the leaves of mutant pea plants lacking chlorophyll-b, in order to check this possible relationship.

The plants were grown under white fluorescent (daylight) lamps which supplied 7.000 lux light intensity throughout a period of 30 days. The growth of the mutant plants was somewhat slower than that of the normal ones. The chlorophyll content of thé mutant plants (chl-a only) calculated on the leaf area, was one third of the value of the normal plants (chl-a + b). The soluble carbohydrate content in the mutant leaves was nearly the half of that of the normal ones, whereas the starch content was practically the same in the two cases. Consequently, the presence of chlorophyll a is not a necessary condition for starch accumulation in the leaves.

LÓRÁND FRIDVALSZKY, ZOLTÁN NEMES and PÉTER GRACZA
(Electron Microscope Laboratory, Institute for Applied Botany and Histogenetics, Eötvös Loránd University, Budapest–Alsógöd and Research Film Department, Instrumentation Service of the Hungarian Academy of Sciences, Budapest)

EXAMINATION OF DIFFERENTIATING MERISTEMATIC CELLS BY LIGHT- AND ELECTRON MICROSCOPE AND MICROKINEMATHOGRAPHIC METHOD

The process of cell differenctiation was studied in the meristematic tissues of the root tip and cotyledon of Allium cepa L., partly by electron microscope in ultra-fine sections, partly by quantitative light-microscopic methods (polarizing- and interference microscope, cytophotometer) in living and fixed preparations, as well as in vivo, by means of microkinematographic shootings. Prior to the inequal division responsible for tissue differentiation, a distinct polarity occurs in the cell, which manifests itself in the migration of the nucleus into the apical part of the cell and, ultrastructurally, in an asymmetric arrangement of the cytoplasm organels. Occasionally a conspicuous accumulation of ER can be observed, as also indicated by cytophotometric measuring results on RNA contents. The division of reserve material also becomes unequal, which appears in the newly built secondary cells as well. In the newly built, young cell-walls some plasmodesms are subsequently formed from the direction of both adjacent cells. Positive differences can be observed in the differentiation of the longitudinal and transversal walls; both the endoplasmatic reticule and the function of the dictiosomes contribute to the increase of the cell-wall substance.

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CHANGES IN THE STRUCTURE, PIGMENT CONTENT AND PHOTOSYNTHETIC ACTIVITY IN THE CHLOROPLASTS OF A TRADESCANTIA MUTANT IN THE COURSE OF THE DEVELOPMENT OF LEAVES

The mesophyll cells in the green segments of leaves of Tradescantia albiflora Kunth. em. Brückn. cv. aureo-vittata contained normal chloroplasts, while in the light-coloured segments aberrant chloroplasts were found.

The mutant set of chloroplasts was heterogeneous even in the cells of leaf-primordia 1 mm in size. Electron-microscopical analyses carried out in young mutant chloroplasts showed grana-like dense bodies with solitary thylakoids and vesicles of different size. In the course of aging destruction occured: the grana-like bodies became swollen, then they disintegrated, which in most of the plastids resulted in a number of enlarged vesicles.

As compared to the normal leaves, the total chlorophyll content of the young mutant leaves was 6 percent, their total carotenoid content 12 percent. During the destruction, the chlorophyll level was diminished to 1/10, the carotenoid level to 1/4 of the initial values. The ratio chlorophyll a per chlorophyll b increased from 1.67 to 1.95.

Studies on $^{14}CO_2$ incorporation have shown that the amount of $^{14}CO_2$ fixed was about 13 percent as compared to the normal segments, and this decreased to 1/3 in the course of the destruction.

Thus it can be stated, that ultrastructural changes are accompanied by simultaneous alterations of the pigment content and photosynthetic activity, but the latter lags behind the decrease of chlorophyll content.

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STUDIES IN THE ANATOMY OF LEAVES AND STALKS OF LOTUS CORNICULATUS L. AGG.

Anatomical examinations have been conducted in about 100 individuals of about 40 taxa of Lotus corniculatus L. agg., a plant growing wild in the Carpathian Basin, as well as in the leaves and stalks of the cultivated birdsfoot trefoil: 1. on the one hand with a view of finding a connection as to main taxa (species, subspecies, variety) between the external morphological marks significant in systematization and internal anatomical structure, 2. on the other hand, to examine the main anatomical marks within the individuals and among the taxa, as well as 3. the anatomical structure of the taxa living in various habitats, in connection with the conditions determined by the environment.

Results of major importance:

1. In examinations of the epidermis of the leaves the measures, properties, number, quantitative distribution, stoma index, etc. of the epidermis cells and stoma are characteristic and determining for the various taxa, the same is true also within the individual. Connection can be demonstrated, on the one hand, between the marks of external morphology and anatomy, on the other hand, between the habitat and the structure of the leaf. There is no definite xeromorphous gradient within one individual.

2. The anatomy of the stalk. It is of no differentiating character with the various taxa, regarding the quentitative appearance and distribution of the reinforcing tissues (sclerenchyma). The connection between the ecological character of the habitants and the formation of reinforcing tissue can be demonstrated. As against the types with prostrate shoots, with the erect-shoot type of cultivated birdsfoot trefoil the formation of reinforming tissue is considerable in the tissue structure of the stalk.

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SOME QUESTIONS OF PISTIL ORGANIZATION WITH SPECIAL REGARD TO THE FORMATION OF INFERIOR OVARIES

Examining the questions of inferior ovary organization, the authors have cleared regarding the formation of the pistil of Helianthus annuus L. and Calendula officinalis L. of the family Composita, that, relying on the arrangement of the vascular bundles, the presence of recurrent bundles, the position of the nodal level, their organization is to be considered true epigeny. A further new result: at the medium level of the torus delimiting the ovary in organization an active mersitematic zone was found by the authors, which enabled the tissue of the torus to develop simultaneously with the developing ovary. On the other hand, in the case of the apparently inferior pistils of Petroselinum hortense Hoffm., Pastinaca sativa L. and Foeniculum vulgare Mill., belonging to the family Umbiliferae, a more active meristematic zone could be observed in the fundamental part of the congenitally joined floral leaves. The activity of this zone brings about the union of the two carpels with the other floral leaves, as well as the formation of a uniform tissue structure. The recognition of the said meristematic zones yields novel evidence as to the question of true epigeny and apparent inferior ovary organization.

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OBSERVATIONS ON THE ORGANIZATION OF THE GYNAECIUM IN HEDERA HELIX L.

As established on a large variety of material collected in the surroundings of Budapest, the transition of vegetative shoot apexes into reproductive ones in the fructifying shoots of ivy (Hedera helix L.) begins in the first part of June. In the floral primordia, the gynaecium differentiates approximately three weeks later than the perianth and the staminal primordia, as reckoned from the beginning of reproductive organization. In the examined samples, the number of the carpel primordia varied between 3 and 4, rather infrequently it was 5. In the course of further organization, the gynaecium does not fully dislplay the development of a typical inferior ovary, it rather corresponds to the character of a "half-inferior" position.

As to the system of the vascular bundles – progressing upward from the peduncle – 10 peripheral bundles can be demonstrated, of which the branchings, running centripetally in the basal region of the flower, indicate the network of bundles supplying the pistil primordia and ovules. The peripheral bundles reach as far as the upper level of the ovule and branch off from there to the perianth and androecium. This refers to the circumstance that also the floral leaves participate in the formation of the wall of the ovary.

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THE EXCRETION CAVITIES OF THE VEGETATIVE AND REPRODUCTIVE ORGANS OF IVY (HEDERA HELIX, L.)

In the roots, stalk and leaves, as well as reproductive organs – except the androeceum – of ivy, schizogenous excretion cavities are formed. The majority of these differentiate from ground tissue and is to be found in the vicinity of the vascular bundles. Their primordia can be observed in the ground meristems of the vegetative and reproductive shoot apexes at the beginning of procambial stabilization, parallelly with the appearance of the first tracheal elements. Following their formation, the epithelial tissue, which performs secretion, consists of 1 to 2 layers in the vegetative organs, while it becomes multi-layered in the pericarp, comprising also the phloem of the bundles.

Besides the above, schizogenous intercellular spaces are also organized in the phloem of the vascular system of the root and stalk at the time of the differentiation of the metaphloem and of the secondary thickening. These are tiny cavities of excretion, develcping in the secondary rays, having single-layer epithelium which consists of few cells.

The cavities which are not or but seldom interconnected, are somewhat elongated and isodiametric; together with the epithelium cells they are filled with yellow excreted subtance of heterogeneous chemical composition.

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ONTOGENETIC EXAMINATIONS ON SCENEDESMUS OBTUSIUSCULUS CHOD

Under suitable experimental conditions the ontogenesis of Scenedesmus obtusiusculus takes place in 24 hours. With the help of a method previously described by the authors, an alga culture, synchronized to 70–80 percent, was set in a 24 hours' cycle. With sampling at intervals of one or two hours, the important morphological changes of ontogenesis became accesible to the light- and electron microscope.

The examination showed the extent of the cytomorphological changes occurring at division with special regard to cell organels, and conclusions could be drawn on the time and the period of these changes.

The authors have found that the division of the single chromatophore takes place at right angle to the plane of the lamellae, and precedes the nuclear division. At the same time the pyranoid is also divided into two parts. The secondary cells are produced with a phase difference, and during the processes of nuclear division, the nuclear membrane is not divided into pieces. The dictyosomes occur by pairs next to the nucleus, and reduplicate at nuclear division. In a certain phase of ontogenesis mitochondria of extraordinary size are to be found. Starch mobilization could also be observed.

The observations of the authors were compared with their earlier physiological examinations on Scenedesmus and with earlier electron-microscopic studies on Botrydium granulatum.

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THE ALKALOID PRODUCTION IN THE TISSUES OF VINCA MINOR

The alkaloid production in the developing and developed organs in the tissues differentiated to various degrees of Vinca minor was examined with combined methods of histochemistry, histo-autoradiography and thinlayer chromatography. The examinations were a continuation of the author's research on alkaloid production, conducted earlier in cell fractions produced by ultracentrifugation.

In inactive samples it was found that Dragendorff's as well as other alkaloid reagents yielded positive reactions even in quite young, developing organs (in 2–3 long gemmae). Already some alkaloid components (Vincamin, Vincaminorein, Vincadifformine) could be demonstrated at the same time also on thin layer. – At that stage alkaloids did not separate yet in the specially organizing cells. On the other hand, in the developed organs they accumulate mostly in the lactiferous ducts, as well as in certain hypodermal parenchymal cells not containing milky juice. At these stages the full spectre of alkaloids of the plant is present.

As shown by the active examinations conducted by means of tritiated Vincamin, the alkaloids are taken up by and transported in the plant. They are distributed in each of the established tissue regions as early as 1–3 days upon incubation. The transport of the radioactive alkaloids can be well observed in the elements of both the xylem and the phloem. In time they accumulate in the lactiferous ducts and in the hypodermal alkaloid cells, similarly to inactive accumulation. In the parenchymal elements of the cortical and medullary tissues radioactive alkaloid can be observed to permeate the plasmodesm, and also get into the stream of the intercellular transport of substances. – In several instances the nucleus and its surroundings become highly radioactive upon the effect of tritiated Vincamin localizing there, which permits to conclude on an active participation of the cellular nucleus also in the process of alkaloid metabolism.

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EFFECT OF DEHYDRATION ON THE ALKALOID SPECTRA OF CHELIDONIUM MAJUS L.

Experiments regarding the economically important Papaver somniferum L. have been conducted at the Department for more than twenty years. The less known Chelidonium majus of alkaloid content, supplied with lactiferous vessels belongs similarly to the family Papaveraceae.

The herb, rhizome and root of this plant are known as drugs in medicine. In DAB 7 its herb dried at 105°C is indicated as official, on the other hand, in Professor A. M. Aminey's opinion the extract of the freshly collected parts of the plant is the most effective one. The contradictory data on the dehydration of the plant suggest the idea that the effective agent (supposedly chelidonine) suffers alterations in the course of dehydration and/or is transformed into another compound of lower value.

In the course of her examinations, the author studied a part of the fresh plants collected and disassembled to organs as to their alkaloid spectra. The remaining part of the material, similarly disassembled to organs, she dried in various ways, thus at 105°C upon enzyme inhibition, at 60°C to air-dry condition and, lastly, at room temperature. She carried out the alkaloid tests following chloroformic extraction and purification,

dropped on an alkaline layer according to Neubauer and Mothes's she developed the spots by means of Dragendorff's reagent. Depending on the dropped pattern, she obtained 6–10 well evaluable Dragendorff-positive spots; further three were presented somewhat more faintly besides them.

Fresh extracts of the plant have a rich alkaloid spectre, mostly in the young leaves of the rosette and in the root at the time of flowering. (From among the alkaloids, the author studied chelidonine, chelerethrine, sanguinarine and berberine in the first place.)

Among the parts of the plants dehydrated in different ways, the spectra of those dried following enzyme inhibition comes nearest to that of the fresh examination material, the others are relatively weaker.

GÉZA CSONTOS and GÁBOR STOHL
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THE VARIATION OF SOME MORPHOLOGICAL CHARACTERS OF THE FIELD-VOLE IN CERTAIN POPULATIONS OF HUNGARY

In the analysis of the morphological characters of the field-vole (Microtus arvalis L.) the principles followed in the population genetics of laboratory rodents cannot be mechanically adopted. In the breeding system of the voles mating seems rather assortative than random. The number of individuals in the populations fluctuates between rather wide limits; following the breakdown of gradation, great territories become depopulated and fill up again from the surrounding reserve areas. Bearing in mind the above properties of the field-vole, the authors analyzed the variations of some more or less closely correlated morphological characters (upper molars, 18 cranial measurements, some body measurements of major importance) of Hungarian populations. When analyzing the microsystematically and population-genetically significant variation of the upper 3^{rt} molar, they applied objective valuation instead of a subjective estimation. The analysis proved that the pattern of the masticatory surface described earlier expressly as of qualitative character, was to be considered a continuously varying quantitative one.

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THE ARCHAEO–ZOOLOGICAL PROBLEMS OF MEAT CONSUMPTION IN THE EARLY HISTORICAL PERIODS

Whatever reasons led the man of the Neolithic to domesticate certain wild animals, the endeavour to increase and safeguard the food basis should be held the primary effects of domestication. The part played by hunted and domesticated animals in ensuring meat during certain eras can be judged from the ratio of the bones of wild and domesticated

animals excavated in the settlement areas. The biological consequences of the difference in the way of living of hunting and animal-breeding man, further of his scantier or richer meat consumption cannot be disputed.

An analysis of the qualitative composition of the consumed meat is possible by taking stock of the animal bones as to the sepcies turned up at the excavations. Special attention has been called to cattle, since its function has been significant for thousands of years both in production and in nutrition, further, together with its wild ancestor, it was the animal supplying the greatest quantity of meat even in the early historian eras. The changes of its body size can be followed in the history of Hungary from the Neolithic to our days. Moreover, recently even the body – weight – values of the single animals can be calculated by means of a formula founded on the proportions of the Hungarian lowland cattle, and this value serves as a basis for conclusions as to the approximate meat-yielding capacity of the animals.

Relying on the author's data, up to the 14th century the size of cattle shows a continuous decrease in Hungary, and that by 30 percent on the average, as compared with the wild ancestor of these animals. On the other hand, the body – weight – values of cows ranges about 200–250 kg. However, it is questionable, whether this phenomenon was not compensated by an increase in number of the livestock or of other animal species. As there is but scanty evidence of this among the archeological finds and, on the other hand, the documents bearing witness to closed times in hunting and fishing turn up in ever increasing numbers, the idea presents itself, that the animal-protein supply of that population which had been increasing in the course of the Middle Ages might have been poorer than in the preceding and following periods.

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(Zoological Department, Hungarian Natural History Museum, Budapest)

THE EVOLUTIONAL SIGNIFICANCE OF ATAVISM IN ORNITHOLOGY

The construction of the natural system of birds meets with considerable difficulties, since fossils are highly incomplete, and the frame of the recent species is uniform to a degree unimpaired in the animal world. The description, systematization and assessment of the atavistic aberrations discussed in the paper greatly contributes to the information avaiable on the evolution of birds. The researches deal with 165 subspecies, 56 species and 11 genera. The results supply with information on the postglacial stock of birds in Europe, on the ascertainment of the natural relationship between the species and on their chronology. Beyond this, conclusions can be drawn also on the rate at wich the process of the formation of species took place. Data are obtained regarding the phenomena of divergence and convergence of species and possibly even regarding the cause of these phenomena. Eventually, the results have enriched research on evolution by a new biological law in the sense of the definition of evolution of Huxley's cline variation series.

GYÖRGY TOPÁL
(Zoological Department, Hungarian Natural History Museum, Budapest)

GLACIAL-PERIOD RELATIONSHIPS OF HUNGARIAN CHIROPTERA

The connections of Hungarian Chiroptera with their foregoers having lived in that territory during the Pleistocene are close in every respect. Certain data indicate, namely, that as to its general aspect, even the Pliocene bat fauna could be most similar to that of our age. Bats much rather shunned the effects of the great climatic changes having taken place in the last one million year, than the other small mammals, and repeatedly changed their range to an increased degree. During this period, a relatively short one in the geological sense, the appearance of new forms became comparatively infrequent. Taxa differing from those of today were the remains of extinct faunas or specialized offshoots of branches rising in the course of time. The function as climate indicator and, by this, the stratigraphic significance partly of the Rhinolophus and Minipterus species preferring the mild, moderate climate, partly of the Eptesicus, Vespertilio and Barbastella species which stand cold, is ecologically most characteristic. Similarly to the one of today, also the Pleistocene faunas were rich in Myotis species living near each other, often also morphologically resembling. The conditions of frequency of the species in this genus displayed a marked change toward the end of the Ice Age, which, beyond the biological reasons, was most certainly connected with man's activity creating new habitats.

ÁRPÁD SOÓS
(Zoological Department, Hungarian Natural History Museum, Budapest)

ZOOGEOGRAPHICAL PROBLEMS OF THE SANGUISUGOUS LEECHES

In the course of his work directed at a survey of the species of leeches, relying mainly on his anatomical examinations, the author solved many a question of taxonomy which supplied with a basis for a revision of several statements of zoogeography, including ecological and, mainly, nutrition-biological information at disposal up to now. Several, thus far misvalued questions were cleared up by him, in the first place regarding zoogeography. In the paper he deals mainly with the sanguisugous leeches attacking man and animals with a constant body temperature.

ZOLTÁN VARGA
(Institute of Zoology and Anthropology, Kossuth Lajos University, Debrecen)

GEOGRAPHICAL ISOLATION AND MICRO-EVOLUTION IN BALKAN HIGH-MOUNTAIN LEPIDOPTERA

The auther studied the variability and intraspecific taxonomical distribution of geographically isolated, Balkan high-mountain populations of Macrolepidoptera. As to their general range, these Lepidoptera can be classified into three main groups.

1. Alpine and Arcto-Alpine species. The centres of their evolution and/or spread are, as a rule, either the high-mountain ranges of Southern Siberia or the Alps. It is in the first place the species also found in the high mountains of Asia, which range in Northern Europe and/or Eurasia; apart from some exceptions, the European-Alpine species have no Arctic area. Their Balkan subspecies are of a peripheric character, and present a conspicuous east-west areal and taxonomic distribution: the subspecies of the Western Balkans are related to the south-east Alpine ones, those of the Eastern Balkans to the Southern Carpathian ones. Descriptions of 6 subspecies, new for science, are added to the above discussion.

2. South-European high-mountain (mainly Ponto-Mediterranean oreal) species. The centres of their evolution were the high mountains of Southern Europe (the Balkans respectively). The glacials they survived in the less glaciated regions of their present areas (e.g. in the "massifs de réfuge" of the Alps, in the Balkan highmountains, in some instances also in the Southern Carpathians), therefore their isolated Balkan highmountain populations are of refugial character. There is no general rule as to their distribution into subspecies' some of them are represented by a single subspecies all over the Balkans, on the other hand, some of them consist of several subspecies.

3. Siberian, Mongolian, Northern Turkestan and Sarmatian species ("Angara" fauna, "invasion fauna"). The centre of their evolution was in the Far East or in North-East Asia; relying on the centres of their range, the given main types can be determined. Since their local European refuges are of secondary character, their Balkan subspecies are peripheric. Three types can be distinguished in zoogeographic respect:

a) The range of the South-European "pseudo-oreal" subspecies (with 4 species) which separated from the boreo-continental area in ancient times (early Pleistocene).

b) "Siberian forest-species" which spread either in the late Pleistocene or early Holocene taiga-transgression phases, and isolated at a later time (with about 50 species, 8 of the subspecies are new for science).

c) Not high-mountain, mainly South-Siberian and East-European species in which common South-Transdanubian – North-Illyrian peripheric subspecies were formed (at 7 species).

ISTVÁN SZABÓ
(Zoological Department, Hungarian Natural History Museum, Budapest)

THE HOST-SPECIFICITY OF THE FLEA SPECIES (SIPHONAPTERA) OF HUNGARY

Considerable part of the parasites of the non-domesticated vertebrates more or less adhere to certain hosts. This specificity as to hosts is more frequent in endoparasites than in ectoparasites, since conditions for the communication of external parasites are more favourable. However, it can be stated of most flea species that – excepting some cosmopolitan ones – there is no about their host-specificity. The considerable material turned up during the intense parasitological examination in course in Hungary at present an assessment of the said host-parasite relation. As a result of recent research it can also be stated that a great many flea species adhere rather to the permanent habitation (nest, den, subterranean burrows) and/or to its microclimate than to the host itself.

JENŐ PAPP
(Zoological Department, Hungarian Natural History Museum, Budapest)

RESULTS OF ZOOLOGICAL RESEARCH OF THE MTS. BAKONY

Scientific research on the theme: "The nature landscape of the Mts. Bakony" has been started in 1962, organized by the Bakony Museum of Veszprém. Hence also the zoological examinations have extended to the Mts. Bakony as a delimited physical geographic area, being the western part of the zoogeographical Matricum.

Zoological examinations extend over numerous groups of vertebrates, insects and molluscs. For the time being the first zoogeographical characterization of the Mts. Bakony is possible merely as founded on the colouring elements. Among the five micro-regions, the Northern Bakony excels with a high number of montane-subalpine species. Various "southern" elements as e.g. Ponto-Mediterranean, Ponto-Balkan and Illyrian ones are characteristic of the Balaton Highlands, the Southern and Eastern Bakony, i.e. to the bulk of the Mts. Bakony. This characterization also holds for the Keszthely Hills, with the complementary remark that numerous Atlantic and Alpine species attain the limit of their range there. The geographical, climatic and, especially, the vegetational conditions form an adequate basis for the composition of the fauna. Relying on the considerable number of "southern" elements, one can conclude that the basic fauna of the Mts. Bakony was formed at the time of the Corylus and Atlantic Ages. The Subalpine elements of the Bakony have, on the other hand, survived since the postglacial firbirch era.

MIHÁLY NEMESSURI and MRS. LÓRÁNT VADAY
(Hungarian School of Physical Training, Budapest and Budapest Technical University, Budapest)

THE KINOGRAPHY OF WALKING

Walking is a basic, progressive motion of man, which originates in the resultants of two systems of forces. One of these is the continuously and in fact steadily operating gravitation field. The other system of forces is muscular strength, the extent of which can be determined by means of measuring the path of motion of the shifted parts of the body with a motion-picture method, founded on the IInd law of Newton. As shown by the motion-picture examination (photokinography) carried out with a special method, 4/5 of the process of motion is a progression period, in the course of which one limb serves to maintain the existing position of the body (single support), while the other, the swinging one ensures headway. During the remaining 1/5 part of time, the macrodyne period (double support), transmission of force happens in shoves. The main expenditure of force originates in the antigravitational muscles (keeping-pushing, postural-pulsion subsystem) which surmount the effect of the gravitation field, and are tonically activated during the entire process of motion. In the first part of the progression period a phasically pulling and, in the second one, a pushing activity can be measured besides this, by means of parallelly connected control. Phasic pushing activity is most intense and diffuse in the macrodyne period.

According to the authors' examinations, the functional tensory-abductory and everting muscles belong to the keeping-pushing subsystem (in the trunk and lower limbs), while the flexory-adductory and inverting muscles to the pulling subsystem. Similarly to walking, great expenditures of strength (marcodyne periods) are tasks falling to the antigravitational keeping-pushing system in most kinds of motion.

ISTVÁN MÉSZÁROS
(Institute of Comparative Physiology, Eötvös Loránd University, Budapest)

CERTAIN ELEMENTARY ELECTROPHYSIOLOGICAL INDICES OF LEARNING IN MAN

As known, the process of learning is accompanied by various changes in the cerebral electric activity. As proved by the examinations of the author, carried out earlier first in animals, then in humans, under adequate circumstances also the cerebral electric signals themselves – e.g. the produced potentials – can serve as indices of learning.

In the course of his examinations, the author used a clapping sound as conditioned stimulus which was followed, upon a definite period – 200–400 msec – by a flash of light as unconditioned stimulus. Following associations performed in such combination, at the time corresponding to the light stimulus – when the retardation period had passed – the conditioned elicited potential was brought about by the sound stimulus alone.

The author found that 1. the appearance of the learned response was facilitated by hypnotic suggestion, 2. the conditionally elicited potential could be registered in the area of both involved analyzers, 3. the time of retardation was an essential parameter of the appearance of the learned response, 4. in the course of learning the "wave of waiting" demonstrated by Grey-Walter was often to be observed.

ESZTER KAPA, ÁGNES JUHÁSZ and GYÖRGY CSABA
(Institute of Histology and Embryology, Semmelweis Medical University, Budapest)

PHYLOGENESIS OF FROG'S MAST CELLS (RANA ESCULENTA)

There are two morphologically and histochemically distinguishable types of mast cells in the frog: alcian blue-positive lymphoid forms to be found mainly in the blood and the spleen, azure positive stained processed cells which are found in the thymus as well as in the mesentery. In the mast cells of the frog besides the biogenic amins serotonin is present. Using the alcian-blue safranine method, the mast cells of untreated frogs show only alcian-blue positive reaction, no safranine positivity can be observed. On the base of these observations we are led to the conclusion, that even the ripest forms of amphibians' mast cells represent the same stage of evolution as the youngest mast cells in mammals. Studyng the effect of thymectomy, splenectomy, corticoid hormone (cortison) and thyroxin treatment on the lifecycle of the mast cells, a change was observed in the absolute number of the different types of mast cells. In consequence of the effect of hormone treatment – similarly to mammals – 4 types of mast cells can be distinguished in amphibians too: 1. alcian – blue – positive, 2. alcian – blue – and safranine-positive, 3. ripe safranine-positive and 4. damaged mast cells.

FRIGYES GÖRGÉNYI, TIBOR LANTOS and JÁNOS PÖLÖSKEI
(Department of Internal Medicine No. 2., Hungarian Institute for Rheumatology and Physical Therapy, Budapest, and Institute of Histology and Embryology, Semmelweis Medical University, Budapest)

THE CHANGE OF THE ACID PHOSPHATASE CONTENT OF THE CELL ON THE EFFECT OF DOSING ACTINOMYCIN D

The observation that the production of certain lysosomal enzymes, as acid phosphatase and esterase, stops shortly following the removal of the cellular nucleus, serves with important data about the events of these enzymes participating in intracellular digestion. The experiments of the authors were directed at revealing the mechanism of the production of the enzyme. In these cytotoxins significantly impeded the act of phagocytosis and, at the same time, also acid phosphatase reaction. This latter was

especially conspicuous when actinomycin D inhibiting RNA synthesis directed by DNA was applied.

The authors performed their experiments in the first place on specimina from an axenic culture of Tetrahymena pyriformis GL of the class of Ciliates. When colorimetrically determining acid phosphatase, they followed Holter's method. The enzyme they determined cytochemically with Gömöri's as well as Barka's method. The biochemical determination of the protein content of the cells they carried out with the method of Lowry and collaborators.

The obtained results show that nucleic acid synthesis decreases to a significant degree following its inhibition with actinomycin D. In a 10^{-5} microgrammes per ml dilution, acid phosphatase synthesis is almost completely inhibited, as evidenced by both the cytochemical and the colorimetric determinations.

LÁSZLÓ KOMÁROMY, ANDRÁS TIGYI, KÁLMÁN LISSÁK and ZSUZSA GOMBOS
(Institute of Physiology and Biology, Medical University, Pécs)

LYSOSOME EXAMINATIONS IN ACINUS CELLS OF THE PANCREAS

By means of examining the acid phosphatase activity, the authors studied the appearance of the lysosomes, as well as their changes dependent on the functional conditions of the cells in the acini of the pancreas of rats.

Pancreases of normal animals, of ones starved for various periods and of ones treated with pylocarpin were processed by light- and electron microscopic methods. By means of light microscopy it could be stated that the acid phosphatase areas – the lysosomes – appeared in the first place among the secretory granules, their number was low in normal animals and higher in consequence of starving. Following pylocarpin treatment, the quantity of the lysosomes of the acinus celle similarly increases to a considerable degree. According to the authors' observations by the electron microscope, the end-product of acid phosphatase secretion in the pancreas acinus cells of the normal rats appeared in primary lysosomes of an order of magnitude of secretory granules. The location of the end-product of the reaction in the primary lysosomes was partly peripheral, partly diffuse. In the case of the starving animals, the diffuse type of end-product was dominant, however, their size differed from that observed in the normal ones and, simultaneously, cytolysomes appeared. In consequence of the effect of pylocarpin, the electron-histochemical picture resembled the one mentioned above.

The results of the examinations point to the circumstance that the activation of the lysosomes being simultaneously with the secretory granules is but slight, and that it increases under the experimental conditions applied, – the consequence of which can be a further cytoplasmatic change.

ANNA NÉMETH, BORBÁLA V. HAFIEK and JÁNOS KOVÁCS
(Institute of Zoology and Comparative Anatomy, Eötvös Loránd University, Budapest)

LIGHT- AND ELECTRON-MICROSCOPIC EXAMINATION OF THE EPITHELIAL CELLS OF THE SEMINAL RECEPTACLE OF THE EDIBLE SNAIL

The internal surface of the seminal reseptacle is lined with high, simple cylindrical epithelium. The cytoplasm of the cells is slightly basophile, and contains an uncommonly great number of granules, having acid phosphatase and esterase activity, therefore it seems a suitable subject for studies regarding lysosome formation.

On the basal parts of the cells a marked plication is to be observed by means of the electron microscope. The plasm membrane adheres to the basal membrane by several semi-desmosomes. In the cytoplasm a well-developed network of filaments can be demonstrated, consisting of bundles running parallelly with the longitudinal axis of the cell. The mitochondria are of the cristate type, the elements of Golgi's apparatus consist of 5–10 disc-shaped cisterns, situated closely side by side, and of the bundles connected to them. The apparatus is polarized, in the cisterns of one side dens substance is accumulated. Large granules containing similar substance can also be observed in the periphery of Golgi's apparatus. Acid phosphatase activity can be demonstrated in them. In the cytoplasm the rough-surface variety of endoplasmic reticulum can be observed. On the free surface of the cells there are micro-villi to be found. The contacting cell-surfaces are connected by septal desmosomes near the surface.

TIBOR LANTOS and EDITH TÖRÖS
(Institute of Histology and Embryology, Semmelweis Medical University, Budapest)

THE EFFECT OF HEPARIN ON THE REPRODUCTION OF PARAMECIUM MULTIMICRONUCLEATUM AND TETRAHYMENA PYRIFORMIS

In specimina originating from a rough culture of Paramecium multimicronucleatum, the authors examined the reversion (backward swimming) ensuing on the effect of M/60 KCl, the speed of motion, the forming capacity of the digesting vacuoles and the rate of reproduction by means of a preparation containing 100 IU of heparin per mg. The effect of heparin was examined, further, also in individuals of Tetrahymena pyriformis obtained from an axenic culture in a 1 percent Bacto-Trypton solution. According to the results, the heparin metabolism of the dividing cells is, to a certain degree, increased, and an optimal heparin concentration is advantageous for division.

A more detailed analysis of the experimental results points to the circumstance that the stimulation processes, vacuole formation and motion, as well as reproduction of

Paramecium multimicronucleatum react to chemical effects, or, more exactly, to that of heparin, seemingly independently from each other. A similar phenomenon can be observed also in the case of the effect of heparin exerted on the reproduction and other vital processes of Tetrahymena pyriformis. Dealing particularly with the phenomenon of reproduction, the authors find that a certain low concentration of heparin suits for accelerating the rate of the development as compared with that of the untreated control specimina. Heparin, as a chemical substance exerts, as a rule, an essentially similar effect in the ciliate unicellulars to the one observed at the examination of the cells of the various multicellular specimina.

ANDRÁS TIGYI, LÁSZLÓ KOMÁROMY and JÁNOS MOLNÁR
(Institute of Physiology and Biology, Medical University, Pécs)

ELECTRON-MICROSCOPIC EXAMINATION OF THE RIBONUCLEOPROTEID COMPONENTS OF THE CELLULAR NUCLEUS CONTAINING D–RNA

As known from the literature, a considerable part of the D–RNA of the cellular nucleus can be obtained in the form of a specific ribonucleoproteid complex. Treatment with actinomycin D, as well as intense extraction greatly decrease the quantity of these particles in the nucleus. Presumably this process can also be followed by an electron-microscopic method.

Among the ultrastructural components of the cellular nucleus the formations of 200-250 Å in size, named interchromatic structures by Swift are to be found. These display a diffuse appearance in the nucleoplasm, and their function is fully unknown.

In their experiments conducted in liver cells of rats, the authors found that, on the one part, following treatment with high doses of actinomycin D, on the other upon fractionated extraction, the quantity of the interchromatic granules considerably decreased, and at the same time – leaving the well-known changes of the nucleolus out of consideration – no other changes could be observed in the nucleoplasm.

From these results the authors draw the conclusion that the interchromatic granules correspond to the D–RNA-containing ribonucleoproteids, identifiable by biochemical and morphological methods from the extract of the nucleus.

LÁSZLÓ JÓZSEF TÖRÖK and LÁSZLÓ KOVÁCS
(Institute of Histology and Embriology, Semmelweis Medical University, Budapest and Medico-Radiological Research Group of the Hungarian Academy of Sciences, Budapest)

PHOSPHOMOLYBDIC ACID-BENZIDINE (PMA–B) METHOD FOR THE CYTOCHEMICAL DEMONSTRATION OF FREE HISTONES

The methods known at present for the cytochemical demonstration of histones are not suitable for detecting the nucleo-histone changes of the differentiated cells or, specified more exactly, for differentiating between bound and free histones. The authors present a new cytochemical procedure, which electively demonstrates the free histone in the nuclei. The principle of their method: in the course of a pre-treatment with phosphomolybdic acid, the molybdate ions linked to the amino-radicals are transformed into a coloured reaction product by reduction with benzidine. The reaction can be performed both in cryostat sections and in sections suitably fixed and embedded into paraffin. The free histone is demonstrated in the area of the chromosome structures by a highly refractive, yellowish-brown reaction product. The molybdate ions bound to the basic radicals of the other structures call forth a green, greenish blue colour reaction, which results in a characteristic background staining. In the cytoplasm, ergastoplasm reacts similarly to basophile staining, for which reaction presumably the basic-protein component of the ribosomes is accountable. The character of the free-histone reaction is fully identic in each examined vertebrate and invertebrate species. This permits the conclusion that the detected nucleo-histone changes are identic or greatly similar in each animal species and cell type. Examinations for a functional interpretation of the reaction are in course.

MIKLÓS KOLLERMAYER and KÁZMÉR JOBST
(Central Clinical Laboratory, Medical University, Pécs)

CONTRIBUTORY DATA ON NUCLEOLAR HETEROCHROMATIN OF THYMUS LYMPHOCYTES

The appearance under the interference microscope of a round or ring-shaped chromatin body inside the swollen nuclei of sucrose-isolated thymus lymphocytes is reported at 120 to 150 minutes of continuous digestion by sucrose-trypsin. The dry weight of a body ranges between 1.8 and 3.0×10^{-12} g, which amounts to about 8 to 12 percent of the nuclear dry weight. Toluidine-blue staining followed by precipitation shows that the bodies are birefringent and of a circularly orientated structure. Histological and histochemical methods failed to reveal RNA-containing granules in the digested nuclei. From these findings the conclusion is drawn that it was the RNP-free, otherwise invisible nucleolar chromatin of dense small lymphocytes that had been demonstrated by the method of the authors. The present study has provided data on the

differentiated structure of nucleolar chromatin, as well as on the trypsin-sensibility and water-binding capacity of nucleolar heterochromatin. These properties differ from those of DNP, forming the greater part of the nucleus.

FERENC SZESZÁK, JÁNOS SÜMEGI and GÁBOR SZABÓ
(Biological Institute, Medical University, Debrecen
and Biophysical Institute, Medical University, Debrecen)

EXAMINATION OF RNA SYNTHESIS ON NATIVE DNA COMPLEXES ISOLATED FROM STREPTOMYCES GRISEUS AND ESCHERICHIA COLI

RNA synthesis in supramolecular structures containing DNA is a basic event of gene activity. Investigation of the phylogenetic development of the supramolecular structures of DNA in cells is possible by studying subcellular fractions of Streptomyces showing intermediary characteristics regarding both prokaryotic and eukaryotic cells, in several respects.

Native DNA fractions of Streptomyces griseus strain No. 52–1 were isolated, examined and compared to similar fractions of Escherichia coli B. Measuring the endogenous RNA-polymerase activity of the native DNA fractions, it was found that the differences in activity obtained at lower and higher ionic strength were greater in the fractions of S. griseus, than in case of E. coli.

The base-composition and sedimentation in density gradient centrifugation of RNA, synthetized in vitro, were investigated. The results showed that the conversion of UTP into CMP in E. coli DNA fractions was considerable, while in S. griseus it was insignificant. The highest specific radioactivity was found in fractions of the 8–10 s region.

Also the template activity of the native DNA fractions was examined with purified E. coli polymerase. At higher ionic strength, the DNA fractions of both S. griseus and E. coli behaved similarly to the corresponding free DNA templates. The presence of some substance hindering RNA synthesis and inhibiting transcription at lower ionic strength is supposed in the S. griseus template.

MIHÁLY SELLYEI
(Department of Pathological Anatomy, Róbert Károly Hospital, Budapest)

LATE REPLICATING (GENETICALLY INACTIVE) CHROMOSOMES IN TRANSPLANTABLE TUMOURS

Examinations conducted with tritiated thymidine (^{3}H-Tdr) proved that in the diploid somatic cells of female test animals, one of the X chromosomes was replicating retardedly. In general each further X chromosome displayed this phenomenon, with one

exception. The late replicating X chromosomes can be seen in the form of sex chromatin in the interphase nuclei; in the prophase they are positively heterochromatic and genetically inactive (Lyon's gene-dose compensation). Harbers and Sandritter pointed to the circumstance that the heterochromatin of the autosomes did not participate as matrix in the biosynthesis of DNA either. They verified biochemically that in malignant tumours heterochromatisation was inreased.

The author examined the replication of the chromosomes in transplantable ascites tumours of mice in vivo, following i. p. administration of ^{3}H-Tdr (0,7 μCi/g body weight). 4 to 8 hours later incorporation of ^{3}H-Tdr could be demonstrated by radioautography in about 30 percent of the cell divisions. Consequently, the marked mitoses were at the end of the phase of synthesis when they incorporated ^{3}H-Tdr. While in JBK and S180 tumours only chromosomal segments replicated retardedly, in the mitoses of the S37 tumour 2–6 telocentric chromosomes of medium length were entirely late replicating (hot chromosomes). By this high-degree inactivation of DNA the lack of defence against proliferation might be explained.

MÁTYÁS HAUCK, JÁNOS ARADI, ATTILA ZSINDELY
and BÉLA TANKÓ
(Institute of Biochemistry, Medical University, Debrecen)

PREPARATION OF RIBO-OLIGONUCLEOTIDES FROM ENZYMATICALLY SYNTHETISED HOMOPOLYMERS

Polynucleotide phosphorylase isolated in this laboratory from Azotobacter Vinelandii was employed to synthetise polyadenylic acid in presence of enough Mg-ions to remove the inorganic phosphate formed during polymerization. This principle was proposed by Sternbach too (F. Cramer, Angew. Chem. 78 (1966/186). The authors improved the procedure in order to increase yield and purity. As much as 90–95 percent of the ADP was polymerised and the method was elaborated to isolate the polymer in pure state by precipitation with acetone and extraction of inorganic salts with dilute acid. The average length of the pure product proved to consist of 35–40 nucleotides. In the ultracentrifuge it was found to be homogeneous ($S_{20} = 1.98$). Organic P amounted to 9.2 percent, inorganic P being absent. Lower molecule weight compounds were only present less than 5 percent. Based on the starting ADP the yield of the product was 65 percent.

This polyadenylic acid and the polyuridylic acid obtained from Reanal was used to prepare oligonucleotides. Both alkaline and enzymatic (with pancreatic RN-ase) degradation was studied and it was found that a breakdown of 30 percent of the internucleotide bonds was optimal for obtaining oligomers with chain-length of 3–9 nucleotides. The most favourable conditions were found to separate the oligonucleotides according to their chain-length. DEAE Sephadex A–25 column with linear concentration gradient of ammoniumbicarbonate gave good results but it turned out, that removal of the 3'-terminal P with alkaline phosphomonoesterase (prepared in this laboratory from E. Coli) was necessary for a clear separation of the 6–9 membered chains in particular.

These 3–9 membered products of the adenylic and uridylic series – with free 3'-OH terminal – are at the authors' disposal in milligramme quantities as suitable models for their studies on the improvement of the periodate method for determining nucleotide sequences.

JURY V. KOZLOV and PÉTER JUHÁSZ
(Institute for Molecular Biology of the Academy of Sciences of the U.S.S.R., Moscow and Institute of Physiology and Biology of the Medical University, Pécs)

HYBRIDIZABILITY OF RNA-S SYNTHETIZED ON DNA SEQUENCES REPEATING TO VARIOUS MEASURE

Renaturating DNA from veal thymus degraded and denaturated by ultra-sound over various periods, the fractions of total DNA repeating to various measure can be separated by hydroxyl-apatite chromatography.

The renaturated DNA fractions present differing template activities in an in vitro RNA synthetizing system.

The synthetized RNA hybridizes with homologous DNA in most different ways. RNA-s produced in DNA of high repetative frequency hybridize in an extreme way (about 70 per cent), the hybridizability of the RNA produced on the "single" sequences was found to be 2–3 percent under given experimental conditions.

The described experiments directly prove that the hybridizability of heterogeneous, animal RNA mixtures practically expresses the proportion in which they contain the marks of the repeating DNA sequences.

PÉTER JUHÁSZ
(Institute of Physiology and Biology, Medical University, Pécs)

RECONSTRUCTION OF THE DISSOCIATED DNP

On the effect of 0.6 M NaCl, mammal DNP (DNP_0) passes highly lysine-rich (f1) histone and a small amount of acid protein. The remaining DNP ($DNP_{0.6}$) is water-soluble also at low ionic strength. Applying $DNP_{0.6}$ as template in the course of in vitro RNA synthesis, template activity and the transcription of the reiterating DNA sequences is markedly increased as compared with DNP_0 (Georgiev, Ameneva and Kozlov, 1957).

The dissociated proteins can be bound back to the DNP complex by means of graduated dialysis, the code-transcription properties of the reconstructed DNP thus obtained fairly approach those of DNP_0.

Attempting reconstruction by means of purified histone fractions [f1, f2 (a), f2 (b) and f3] no chromatin preparation can be obtained of which the properties would resemble DNP_0.

JÁNOS MOLNÁR and LÁSZLÓ KOMÁROMY
(Institute of Physiology and Biology, Medical University, Pécs)

PRODUCTION OF HIGH-PURITY INFORMOFEROUS PROTEINS

The analysis of informoferous proteins necessitates their production in preparation measures. Earlier the authors centrifugalized the cellular-nucleus extract of D–RNP-content in a linear saccharose gradient, the material of the 30S zone meaning the source of the informoferous substance.

In the method described here, the cellular-nucleus extract is purified by gel-filtration. The ribonucleoproteid containing D–RNA obtained in this way, centrifugalized in CsCl equilibrium density gradient, as well as on the basis of electron microscopic morphology, corresponds to the 30S particles purified in saccharose gradient. Examined by polyacrylamide-gel electrophoresis, the ribonucleoproteid contains exclusively informoferous proteins.

The advantages of the method are as follows:

The D–RNA containing ribonucleoproteid can be isolated without an ultracentrifuge, at a 2 or 3 times greater efficiency, than with the earlier method. A further remarkable advantage: the time of the isolation process can be decreased to the half, and thus the damage to the particles in the course of the operations is minimal as well.

JÓZSEF BIERBAUER and JUDIT MOLNÁR
(Institute of Histology and Embryology, Semmelweis Medical University, Budapest)

THE FUNCTION OF THE EYE-TENTACLE OF STYLOMMATOPHORA IN THE REGULATION OF THE HERMAPHRODITIC GLANDULE

In the animal world it is with the snails that a special manifestation of hermaphroditism can be observed in which gametogenesis takes place in a single gonad: in the follicles of the hermaphroditic genital gland. The relative preponderance of ovogenesis and spermiogenesis presumably depends on some regulating mechanism. Relying on recent data on Stylommatophora, the eye-tentacle has an important part in the said regulation.

The examinations of the authors were conducted in the species Helix pomatia and Fruticicola fruticum. Groups of snails "wakened" from the state of winter repose, were treated with oestrogenic and/or androgenic hormones, on other groups this treatment was effected upon removal of their tentacles. The hormone preparations applied were: 1. testosterone-phenyl propionate (Retandrol): 0.4 mg/10 g; 2. oestradiol stearate (Depofollan): 0.002 mg/10 g. The hormone doses were given intramuscularly, each on one occasion. The control – and experimental specimina were histologically processed after one, two and three weeks. It was found that, following the removal of the eye-tentacle,

already after two weeks the number of ovules in the hermaphroditic gland increased as compared with the controls. The number of ovules showed a similar increase in those experimental snails which, – their tentacles having been left intact – received Depofollan treatment. This effect was even increased, if the hormone was given after the removal of the tentacle. As compared with the control specimina, a more intense spermiogenesis was to be observed in the intact snails and in those treated with Retandrol.

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CONTRIBUTIONS TO THE FINE-STRUCTURE OF THE NEUROSECRETORY CELLS OF THE FRESHWATER MUSSEL (ANODOTA CYGNEA)

For examination by the electron microscope, the cerebral-, foot- and visceral ganglia of the molluscs were excised by means of sharp scissors within one minute – without narcosis-, and placed into a fixing solution, where they were kept through 3 hours. As fixative solution 1 percent osmium tetroxide, pH 7.4, was used. Upon fixation, the substance was embedded, through acetone dehydration, into araldite. Ultra-thin frontal-plane sections were made of the cerebral ganglion by means of a Reicher OMU–2 glass ultramicrotome, these were then contrasted by lead citrate and photographed in a JEM 6C electron microscope, electronoptically magnified to 2.300–9.000. The examinations were carried out in summer and autumn.

Founded on the light- and electron-microscopic examinations, the author could state that in each of the three pairs of ganglia, representing the central nervous system of the fresh-water mussel, there were nerve-cells to be found (A_1 and B cells) which contained granules readily staining with paraldehyde fuchsin and smaller than 1/2 μ. Relying on the results of the examinations by the electron microscope, the subtance demonstrated by these staining methods corresponded to electron-dense corpuscles – identified with neurosecretion in the literature. These corpuscles could be identified with the granules demonstrated by paraldehyde fuchsin in the half-thin sections of substance embedded for electron microscopy. The granules larger than 1 μ were pigment grains.

IRÉN VITÉZ
(Institute of Zoology and Comparative Anatomy, Eötvös Loránd University, Budapest)

INVESTIGATION OF NEUROSECRETORY CELLS OF ISOPODES IN LIGHT- AND ELECTRON MICROSCOPE

The neurosecretory cells of some terrestrial species of Isopoda (Porcellio laevis Latreille, Porcellio dilatatus Brandt, Protracheoniscus asiaticus Uljanin) were examined by

light- and electron microscopic methods. The structure of two special cell-types was studied in details: the phloxinophile cells situated in the protocerebrum (described for the first time by the author), as well as of the γ-cells of the lobus opticus. New data were achieved concerning the structure of these relatively little-known cells.

TIBOR MONTSKÓ, ISTVÁN BENEDECZKY,
ANDRÁS TIGYI and KÁLMÁN LISSÁK
(Institute of Physiology and Biology, Medical University, Pécs)

RECENT DATA TO THE REGULATION OF THE CALCIUM LEVEL OF THE BLOOD OF RANA ESCULENTA

The experiments of the authors were conducted in female specimina of Rana esculenta in winter months. They found that the complete extirpation of the parathyroid glands called forth hypocalcaemy within 6 days which was, however, less marked than in mammal species. They found further, that, contrary to the observations in Cyprinus carpio, the calcium content of the surroundings had hardly any effect on the serum Ca level of their experimental subject. The effect of EDTA in conditions with intact and extirpated parathyroid glands was analyzed.

Further they examined the ultrastructure of the parathyroid gland of Rana esculenta. The examinations were carried out with the application of various fixing procedures, and directed to obtain information on the cell-types characteristic of the winter period, as well as on the normally and hyperactive conditions. Hyperfunction of the parathyroid glands was called forth by treatment with EDTA. Hyperactivity was manifested in the first place by an increase in number of the secretion granules. The authors extended their observations also to other cell organelles.

GÉZA ZBORAY
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Eötvös Loránd University, Budapest)

EFFECT OF STRESS STIMULI ON THE ACTIVITY OF THE HYPOTHALAMUS–HYPOPHYSIS–ADRENAL SYSTEM OF FROGS

The author studied the effect of intramuscularly injected formalin, ether narcosis and intralymphatic insulin injection on the steroid production of in vitro incubated adrenal glands of Rana esculenta. He expressed the obtained values in gamma steroid (100 mg of adrenal) per hour. The frogs were sacrificed 60 min following the treatment.

Frogs examined in summer responded to the applied stress by increased hormone production. In those starved for one month following transport, the formalin stress caused a decrease of the hormone production of the adrenal glands.

Treatment was inefecctive in the groups examined in winter, excepting the one injected with formalin, where the steroid production of the adrenal glands decreased. Relying on the results of the authors, it can be ascertained that:

1. The hypothalamus–hypophysis–adrenal system of Rana esculenta can be activated by stress stimuli;

2. the development of the effect shows a dependence on the season of the year;

3. for the incapacity to respond of the frogs in winter presumably the hypothalamus-hypophysis system is accountable, namely their adrenals react to ACTH also in winter.

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IN VITRO EXAMINATIONS ON THE HYPOTHALAMUS–HYPOPHYSIS SYSTEM OF RANA ESCULENTA

The aim of the authors' experiments was to find out what part could be played by the hypothalamus and pars nervosa in the control of the function of the pars distalis and, through the latter, of the suprarenal glands under physiological conditions. Their results were as follows:

a) Upon the effect of the homogenate of 1, 2 and 3 pieces of pars distalis, the steroid production of the in vitro incubated adrenal glands increased by 30, 42 and 55 percent.

b) ACTH produced by 1 pars distalis in 60 min increased the hormone production of the adrenal glands by 30 percent.

c) If the pars distalis had been incubated together with an extract prepared of the median eminence and of a part of the infundibulum and/or of the pars nervosa, the ACTH production of the pars distalis increased. ACTH produced in this way brought about a 60 and/or 40 percent increase in the secretion of the adrenal gland.

d) ACTH activity found in the pars nervosa was approx. 7 percent of the value observed in the pars distalis.

The authors' experiments corroborate the assumption known mainly from morphological examinations that the activity of the pars distalis of amphibians is controlled, in the first place, by the so-called releasing factors, produced in the diencephalon. The authors succeeded in demonstrating such substances of corticotrophine-releasing activity both in the hypothalamus and pars nervosa.

LAJOS KONDICS
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EXAMINATIONS REGARDING THE ZONAL DISTRIBUTION OF THE CORTICOSTERONE PRODUCTION OF THE SUPRARENAL GLAND OF COCKS

Small pieces of peripheral and deeper-situated zones of one of the suprarenal glands of ten 14 months old Leghorn cocks were incubated "in vitro", and the produced corticosterone was determined by fluorimetric method. Of the other suprarenal gland electron- and light-microscopic preparations were made. The peripheral zone of the cock's suprarenal gland generally produces 3 times more corticosterone than the one situated deeper. If ACTH was added to the incubate, the hormone production of both zones increased, depending on the given dosage; however, the increase was more significant in the zone lying deeper. In case of administering 0.15 I.U. of ACTH per 10 mg suprarenal gland the corticosterone production of the second zone already surpassed that of the peripheral one.

Comparing the obtained results with the light- and electron-microscopic findings, it can be stated that under control conditions the outstanding secretory activity of the peripheral zone finds its explanation in the first place in the higher number of cortical cells. The increased corticosterone production in the deeper zone, ensuing on the effect of ACTH, can be explained presumably by the different sensitivity of the zones and/or by the increased corticosterone → aldosterone transformation in the peripheral zone.

ANDRÁS FODOR, GYÖRGY PETHES, SÁNDOR LOSONCZI, ANTAL OROSZ and MIHÁLY KURCZ
(Institute of Genetics of the Hungarian Academy of Sciences, Budapest, Radioisotope Laboratory and Blood Group Laboratory, University of Veterinary Medicine, Budapest, Institute of Comparative Physiology, Eötvös Loránd University, Budapest and National Institute of Public Health, Budapest)

THE CONNECTION BETWEEN SENSITIVITY TO THYREOTROPHIC HORMONE (TSH) AND THE ^{131}I TRANSFORMATION RATIO OF BLOOD PLASMA (CR) IN POULTRY

The authors studied in non-inbred white Leghorn chickens the total and protein-bound ($PB^{131}I$) radioactivity of the blood plasma, as well as the CR and inorganic $PB^{131}I$ per inorganic ^{131}I ratio in connection with exogenous TSH dosage. No connection between the doses and the examined parameters could be demonstrated.

Further, they examined poultry species differing in TSH sensitivity – as shown by the in vitro measurements – (naked-neck Transsylvanian and bantam), as well as the F_1 and

F_1 x bantam (B_1) hybrides of the two species displaying the increased TSH sensitivity characteristic of bantams. Blood was taken from the vein of the wing of the same chickens on the lst, 2nd and 8th day upon administration of the radioactive iodine. Following the last drawing of blood 0.3 I. U. per 100 g live weight of TSH was injected into the chickens and, 24 and 48 hours thereupon, blood was taken again. The total and the $PB^{131}I$ radioactivity the plasma specimina obtained from all blood samples were measured and the CB ratios calculated.

The lowest total and $PB^{131}I$ radioactivity was shown all along by the species less sensitive to TSH. One day upon administration of ^{131}I the value of CR was lowest similarly in this group, later, however, reminding of Mellen's (1968) hypothyroid animals, it became equal with the values of the other three groups. TSH decreased the values of all groups, however, the decrease was much smaller in chickens less sensitive to TSH than in those of the other groups; although the value of $PB^{131}I$ was highest in this group similarly at that time.

The authors suppose that the TSH sensitivity of the individual significantly influences its CR value. On the evidence of these experiments, the value of CR depends much more on the individual TSH sensitivity, than on the applied dosis of TSH. For the biological titration of TSH, therefore, the CR value is deemed possible and acceptable at the most in poultry-lines selected for TSH sensitivity.

TIBOR MURAY, GYÖRGY PETHES and ANDRÁS FODOR
(Institute of Genetics of the Hungarian Academy of Sciences, Budapest and Radioisotope Laboratory, Department of Physiology, University of Veterinary Medicine, Budapest)

THE EFFECT OF THYREOTROPHIC HORMONE (TSH) AND METHOTHYRIN (1-METHYL 1.2 MERCAPTOIMIDAZOLE) ON THE ^{131}I UPTAKE AND TRANSFER OF SURVIVING SECTIONS OF POULTRY THYROID GLANDS

The authors looked for characteristics of thyroid gland function to be studied in vitro, which well reflect deviations in individual TSH- and metimazole sensitivity.

Thyroid glands of inactive, as well as in vivo ^{131}I-injected poultry were cut up, and placed into inactive or ^{131}I-containing Parker 199 media. The authors studied the uptake and transfer of ^{131}I of inactive thyroid tissues; the in vitro transfer of in vivo uptaken radioactive iodine into inactive media in media in case of untreated samples, of ones treated with TSH – metimazole or TSH + metimazole. The control of each treatment was the intreated piece of the thyroid of the same chicken. In their experimental equipment they had pervaded the solution containing the thyroid cuttings by an $O_2 : CO_2$ gas mixture of 95 : 5 volumetric proportion.

The effect of TSH could be measured best with the increase of the protein-bound radioactivity of the (originally inactive) incubate containing ^{131}I taken up in vivo and transferred in vitro, between the 1^{st} and 3^{rd} hours of incubation. Metimazole intensified

the transfer of the in vivo uptaken radioactive iodine to a significant degree. Between dosage limits of 0.0048 and 4.8 mU, a connection of the concentration of TSH and the transfer of the isotope-iodide taken up in vitro was presented. An increase of the in vitro ^{131}I uptake caused by TSH and the in vitro transfer of the radioactive iodine taken up in vivo could not be demonstrated, partly on account of the considerable individual standard deviation, partly owing to the transfer of a great quantity of a specific radioactive iodine. When discussing their results, the authors compare them with Newcomer's (1967) kinetic results.

GYÖRGY PETHES and SÁNDOR LOSONCZY
(Radioisotope Laboratory, Department of Physiology, University of Veterinary Medicine, Budapest and Blood-Group Laboratory, University of Veterinary Medicine, Budapest)

THE SIGNIFICANCE OF THE BURSA FABRICII IN THE ONTOGENY OF THE FORMATION OF IMMUNE REACTIONS

Upon extirpation of the Fabrician burse, the rate of deaths increased. According to the data in the literature, this considerable number of deaths is brought about by the decreased specific immune reaction of the bursectomized specimina, as well as by the lack of certain γ-globulin fractions.

The authors sought for a further explanation of this phenomenon. They examined the time of formation of natural antibodies of antibacterial effect in species of geese and hens, and conducted studies in order to find out whether the extirpation of the bursa Fabricii had an influence on the quantity and time of appearance of these antibodies.

Relying on their experimental results, they found that, as a consequence of bursectomy, immune reactions were formed with delay. Besides, they serve with further data regarding the immune-biological significance of the Fabrician burse and the course of development of the immune potential of the birds.

KATALIN MADERSPACH, MIHÁLY KURCZ, IVÁN NAGY, PÁL BARANYAI, and LÁSZLÓ GRÁF
(National Institute of Public Health, Budapest, Heim Pál Hospital for Children, Department of Paediatry, No. 1, Postgraduate Medical School, Budapest and Institute for Pharmacological Research, Budapest)

PRODUCTION OF PROLACTIN ANTISERUM WITH HIGH ACTIVITY BY IMMUNISATION WITH MICRO-DOSES

The production of pituitary tropic hormones in pure form involves considerable difficulties. The isolation of hormone in sufficient quantities from animals with small pituitary gland is particularly difficult. Antiserum production is, therefore, greatly facilitated by procedures wich reduce the hormone quantity necessary for immunization.

According to literary data generally 1–20 mg prolactin preparation with approximately 20 I.U./mg specific activity is injected on 3–4 occasions into rabbits in order to obtain anti prolactin sera of high titres.

The authors isolated highly active bovine prolactin (about 45 I.U./mg) and used the preparation in immunological experiments. Antiprolactin serum with high activity was produced in rabbits by injecting 4 X 25 μg or 2 X 250 μg of the purified preparation together with Freund's adjuvant. The injections of 4 X 250 μg of the above preparation also produced antiserum in ducks. Some hundred μg of human somatotropin-prolactin preparation proved to be also sufficient to obtain high-titre monovalent antisera in rabbits and ducks.

The properties of these antisera obtained by immunization with micro-doses were extensively studied.

CSABA VADÁSZ, MIHÁLY KURCZ, IVÁN NAGY
(National Institute of Public Health, Budapest and Heim Pál Hospital for Children, Department of Paediatry No. 1. Postgraduate Medical School, Budapest)

ARTIFICIALLY INDUCED MATERNAL BEHAVIOUR AND LACTATION

The development of the alveoli in the mammary gland and signs indicating milk secretion have been demonstrated on the effect of a variety of interventions. However, no reports are available on experiments inducing lactation by hormonal stimulation. In this concept authors understand under "lactation" not only the secretory phenomena of the cells in the mammary gland but also the fact that the mother rat is capable of raising its litter.

The examinations were carried out in inbred, intact, adult female rats. Following a three-week treatment with estrone, progesterone, thyroxin, prednisolone and prolactin, 4–6 days old youngs were admitted to the adult animals. The litters were changed.

Studying the maternal behaviour and lactation of the animals it was found that "artificial lactation" was a condition also suited to raise viable progeny and in this rescept it did not differ significantly from that observed in mothers bearing youngs. The sucking stimulus was in itself suitable to maintain maternal instinct and lactation. The intensity of milk production was assessed by recording the daily body weight increase of the litter. The milk yield of the rats with "artificial lactation" was about 20–40 percent lower than that of the normal lactating controls.

Pituitary STH and LTH contents were compared in treated and normal lactating animals. It was found, that LTH content increased, STH content decreased in rats with "artificial lactation", however, the changes were not significant.

Lactation and "maternal instinct" could not be induced in male rats by the above procedure, but a slight lobulo alveolar development of the mammary gland could be observed.

ANDRÁS PUPPI, ANDRÁS TIGYI, LÁSZLÓ SZALAY
and KÁLMÁN LISSÁK
(Institute of Physiology and Biology, Medical University, Pécs
and Institute of Chemistry, Medical University, Pécs)

INFLUENCE OF THE OXIDATION-REDUCTION POTENTIAL OF THE ENVIRONMENT ON THE CHARACTER OF THE EFFECT OF 5-HYDROXYTRIPTAMINE

The effect of the oxidation-reduction potential of the environment on the manifestation of the inhibiting and/or stimulating character of 5–HT was examined by means of myographic and oxidation-reduction potential measuring methods in muscle preparations obtained from various species. In the experiments the authors found that 5–HT was of stimulating (depolarizing) effect at tissue oxidation-reduction potential values of + 155 mV or lower, whereas at levels higher than that, it was of inhibitory (hyperpolarizing) effect. Since, by means of artificially setting the oxidation-reduction potential value of the environment, the stimulating effect can be induced also in tissues where 5–HT has originally exerted a hindering effect, the authors conclude that in the manifestation of the depolarizing and/or hyperpolarizing character the environmental oxidation-reduction potential has an important part.

GÉZA HONTI
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POINTS OF INTEREST IN THE BIOLOGY OF THE EFFECT OF POLYOXYMETHYLENE GLYCOL

Polyoxymethylene glycol was used as adjuvant in the treatment of tumorous patients. Reying on the results of certain animal experiments, an effect inhibiting oncogenesis was attributed to this agent, explained by its protein-fixing and – preserving properties. The author used the drug with good results in the treatment of allergic patients, but it also proved favourable in cases of influenza. Its antihistaminic effect could be demonstrated also in guinea-pigs (chemosis test). Still the drug did not inhibit, but even favourably influenced the defence against infections. It has also a marked corroborating effect. The joint appearance of these effects can be explained by the protein-preserving, histaminolytic and ACTH mobilizing affect of the drug.

ZOLTÁN AVAR, EMIL MONOS and FELICIA SLOVIK
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INTRAUTERINE FOETAL DEATH WITH HYPOTHALAMIC LESIONS

Relying on the experimental results of the authors it is to be supposed that the decrease of the vitality of the foetus and its death within the uterus can be brought into connection with lesions of certain structures of the central nervous system. On the other hand, according to data in the literature regarding humans, the development of the foetus very often remains undisturbed in case of various diseases of the brain.

In the course of their present work, the authors examined whether in pregnant women deceased in consequence of cerebral disease, whose foetus had died earlier within the uterus, a structural damage in the lateral hypothalamus could be demonstrated. Among the patients treated in the Hungarian Research Institute of Neurosurgery during the past 8 years, the authors found 3 cases (2 cerebral tumours and 1 cerebral thrombosis) where intrauterine death ensued preceding the mother's decease. In each of the three cases, damage to the lateral hypothalamus could be proved.

The authors presume that also the lateral region of the hypothalamus has a part in the development of the vitality of human foeti. They call the attention upon new diagnostical aspects based on their observations.

GYÖNGYI BUJDOSÓ, ANDRÁS FONYÓ, ENDRE SOMOGYI and PÉTER SÓTONYI
(Institute of Forensic Medicine and Laboratory of Experimental Research, Semmelweis Medical University, Budapest)

IN VITRO EFFECT OF $HgCl_2$ ON THE STRUCTURE AND FUNCTION OF THE MITOCHONDRIA

Hg (II) ions are SH poisons, which act on a variety of SH proteins. The authors' examinations were aimed at clearing up how these ions influenced the electron-microscopic structure and integrated oxidation processes of isolated liver mitochondria.

Parallelly with concentration of the applied Hg (II) ions, first enzymological, the electron-microscopical changes were developing.

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