

- čelověčeskoj kisti. — *Russkij antropologičeskij žurnal*, 15. 1—2: 50—70, 1926.
- MARTIN, R., SALLER K.: *Lehrbuch der Anthropologie*. — G. Fischer, Stuttgart, 1957.
- ROUBAL, J., PACHNER, P.: *Ruce pracovníků — ČLČ*, 80. 36: 2—4, 1941.
- ROUBAL, J.: *Držadla u nástrojů a u ovládacích pák strojů*. — *Prac. lék.*, 13. 4: 176—178, 1961.
- URBACH, V. J.: *Biometričeskije metody*. — *Nauka*, Moskva, 1964.

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ANTHROPOLOGY, MEDICINE, AND THE INTERNATIONAL BIOLOGICAL PROGRAMME

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In the first part of my report I would like to tell you something about the views of a pioneer in anthropology, Dr. Aleš Hrdlička, on the problem of the relationship between anthropology and medicine, while in the second part I would like to draw the public's attention to the intentions and aims of the International Biological Programme, which stands in very close relationship to the problems discussed in today's symposium session.

It is characteristic that Hrdlička's first contribution to the journal newly founded by him, the "American Journal of Physical Anthropology", in 1918, published in the first number, is entitled "Anthropology and Medicine". This topic was dealt with by Hrdlička in the journal "Science", in 1928 (Vol. LXVII, No 1737). In the first mentioned report he deals with the close and direct relationship of anthropology to medicine and he shows in brief what doctors, particularly anatomists, had done for anthropology. (I would like to mention here an analogy in Czechoslovakia in the time between two World Wars). In the other report he defines anthropology in rough comparison as a daughter and continuation of medical science. He says: "The best and shortest definition of anthropology today (1928) is that it is human phylogenesis of man's past, present, and future. Taken in greater detail, this is the science about the origin and evolution of man or human phylogenesis, secondly this is a comparative science about the human life cycle from fertilization to the end of human ontogeny, and thirdly this is a science about human variation. All that simply means that it is the biology of man and a developed comparative anatomy of man, physiology, chemistry, and, up to a certain extent, also pathology."

A significant feature of anthropology, which distinguishes it from medical science, is its comparative character. It studies in the first place human groups of certain age, sex, race, social status, vocation, possible abnormality, and compares them with the others. As far as the "practical" application is concerned — Hrdlička continues to say — there is the difference in that medicine endeavours essentially to restore the damaged or ill health of man, while anthropology tries to discover and show the noxious as well as the beneficial factors of further human development. With considerable justification, anthropology could be designated as medicine of human groups.

As it is, anthropology is thus useful for medicine with the majority of its research activities (whether directly or indirectly). It is another point that medicine has not, or cannot have full advantage of anthropological knowledge, and that it is connected with its similar inability as compared to biology, physics or chemistry. This is the trouble with assimilation. It can, however, be said at once, that medicine is now using the numerous results of anthropological research activities, without being aware of their sources.

Thus for example:

Research activities in physical anthropology began on the material from the fifties of the past century. That total number of anthropological publications had reached (by 1928) many thousands.

Further, Hrdlička analyses the works according to a loose-leaf catalogue and gives the contributions in accordance with entries selected incidentally: skull, children, pelvis. Consequently he analyses the contents of the oldest anthropological journal, "Bulletin of the Anthropological Society in Paris", as well as the contents of his own journal mentioned above — the first ten volumes.

The representation of the particular topics in the "A. J. P. A." by per cent is as follows:

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| evolution of man | 13.4 % |
| embryology, development of child, adolescence, old age | 11.6 % |
| human variation, races | 43.6 % |
| heredity, demography, abnormalities | 5.5 % |
| comparative physiology of man | 11.0 % |
| characteristics of U.S. population | 3.5 % |
| reports of general character, history, methods | 13.4 % |

The author had made a list of all reports for the renewed journal "Anthropologie" since its foundation in 1923 until it was stopped in 1941, and he is convinced, so much the more that both journals had a common scheme of topics, that the representation of works in the division given would find a similar response.

Dr. Hrdlička further selected the titles of articles in the first three volumes of the American anthropological journal, and pointed out certain reports. Further he gives the merits of known writers whose studies are of use to medicine: Broca, Retzius (brain), Manouvrier (brain physiology), Virchow (skull deformities), Quetelet, Vierordt (body proportions), Galton, Lombroso (heredity, abnormal and defective groups), Ruffer (prehistoric pathology). He mentions also some older American authors as Morton, Bowditch, Sargent, Mall, and others, and from the then living he mentions Bean, Boas, Davenport, Hooton, Terry, Danforth, etc. Under the title "Anthropologists of the Smithsonian" he gives his reports on the Red Indians, on the weight and preservation of the brain, physical and physiological characteristics of the white Americans, about ear tumours, dental arches, etc.

The contributions of anthropology to medicine are divided by Hrdlička into the following three main parts:

1. those elucidating man's evolution both in the past and present,
2. those helping to get to know human variation,
3. those providing normal standards for medicine.

The knowledge of past and present developments containing indications for the future is necessary for medicine. Equally necessary for medicine in the future will be the knowledge of human variation, which teaches that everything, i.e., the structure of body, organs and their functions, causes of diseases and their course, undergo a significant variation, even in normal, uncomplicated conditions. Without understanding the normal variations of each individual character, each process and expression of normal and abnormal man, it is impossible to understand any branch of medicine. Here anthropology has been and continues to be a useful help to medicine. To prove this, Hrdlička deals in his article with the weight limits of children of definite age and of adults, boundaries of the pulse, of the size of the head, the pelvis, etc. The third chief service of anthropology to medicine — Hrdlička continues — is that it provides norms. In order that a doctor might properly appreciate a particular part of the body (its size or proportionality), he must observe the norms of the respective part and population at a given time. It is the very task of anthropology to work out such norms, and limits of normal variation. Hrdlička himself had provided norms for the American population in his study concerning the so-called "Old Americans".

The author concludes with an appeal for closer cooperation between anthropology and medical science by pointing to the fact that Europe and other continents (Japan) possess a greater knowledge about the use of anthropology in medi-

cine than in the U.S.A., he prompts to better utilization of anthropological collections for the study and improvement of the state in the given directions, which he considers not only useful, but also necessary.

So much Hrdlička in 1928. Much has changed since that time, something still holds good, is prompting and worth following. Development goes on, gaps in the knowledge of human groups are being bridged. At the same time, however, a proper branch of anthropology has developed and enters the system of sciences both from the viewpoint of individual countries and on a world scale. New anthropological methods as well as an organisation of international cooperation are developing. An example of such cooperation is the "International Biological Programme" (I.B.P.) founded two years ago under the sponsorship of the World Council of Science Unions.

In accordance with the all-over-the world-scale, the section of the I.B.P. dedicated to man is supposed to gain fundamental data on man's physical ability, heredity, growth, and body structure, as well as on man's adaptation to extreme conditions. National committees of the countries listed for cooperation will choose some of the given topics, which they will be dealing with within the following five years. Research comprising unified methods is to start next year. World experts of I.B.P. have been entrusted with working out methodical handbooks that would ensure uniformity in gathering research material, and in its treatment. The scientists of the participating countries charged with conducting research must be in close contact with these world experts. Czechoslovak Government has applied for full-scale cooperation. The Czechoslovak Academy of Sciences has set up a commission for I.B.P. whose chairman is the Academician Ivan Málek, and a sub-commission for problems of man headed by Prof. Dr. O. Poupá. The latter performs research in the field of growth and evolution, physical efficiency, nutrition, and human genetics. It also takes care that the particular working places taking part in fulfilling the tasks would adequately be equipped with apparatus and the like.

Czechoslovakia has good conditions for realizing the research project of I.B.P., and, for the most part, can continue in its own traditions. Some problems have already been worked on, others are part of the national research project and departmental plan. Anthropologists will take immediate part in fulfilling the tasks concerning the growth and physical structure, and will cooperate in the research of nutrition conditions, and physical ability largely by performing anthropometric measurements. Research is also being carried on in aged persons and citizens of Gipsy nationality in Czechoslovak territory, both being parts of a research project of international importance. I.B.P. stands only at its beginnings, but it affects even now largely the organized and centralized systematic work. If the International Biological Programme succeeds on an international scale in uniting the research methods and concentrating its attention upon the suitably chosen tasks, this event will mark an important turning-point in the development of anthropology and biology in general.

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ANTHROPOLOGY AND SPORTS MEDICINE

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Anthropology is very closely connected with sports medicine and physical culture in general. Different anthropological methods have been used in medicine already from the very beginning of this branch of science. One of the first doctors to use anthropometric methods in Czechoslovakia within the scope of studying the influences of physical culture upon man, were Krupička (1872) and Maydl (1884).

Extraordinary for its time was Silberer's report (1882) dealing with the importance of physical training from

the standpoint of Darwin's theory, and Panýrek's study (1899, 1900) supporting "rational physical training" which harmonically develops all parts of the human body and leads to the acquisition of a number of suitable qualities. One of the first writers to make mention of the physical characters of sportsmen, in the world literature, was Steggerda (1887), further Arnold and Seaver (1896), who described acrobats from the viewpoint of anthropometry, Bemies (1900) who studied typical characters of runners and jumpers, and in Czechoslovakia Chodounský (1903) who noticed not only the age, but also the bodily qualities of sportsmen, specific for a certain kind of sports. Later, Krümmel (1921) described the differences in bodily proportions among sprinters and runners, among gymnasts and swimmers, while Herxheimer (1921) appreciated the effect of athletic exercises upon the body of young people. A true pioneer of sports anthropology was Kohrausch (1923) who was the first to determine the types of sportsmen's bodies on the basis of detailed anthropometric examinations.

We could very well name this period of sports medicine the morphological phase. At the earliest beginning of sports medicine morphological research aspects prevailed in anthropological works, and measurements of body proportions and the establishment of "sports" types were major objects of some investigators.

This phase was replaced later by the functional tendency. It was found, that, just as any functional evaluation without a morphological substrate is of little value to physical culture practice, also morphology lacking a satisfactory knowledge of functional aspects offers merely a very one-sided view.

At present this latter phase goes over to the preventive tendency. This is an indivisible combination of morphological and functional indicators with the aim not only to describe, but to affect, on the base of the obtained results of examinations, the bodily building and ability of present populations. The results of these anthropological activities point not only to the favourable effect of sports, but also to certain undesirable consequences of one-sided training. At present, where the specialization of sportsmen often begins in early age, these results are of particular value in the medical control of sportsmen.

Of both theoretical and practical importance in sports medicine are the studies of the somatotype of persons going in for sports, and of its relationship to efficiency. The methods in use are numerous, but none is completely satisfactory at present. It is indisputable that the creation of a link will be necessary to combine even in this place morphological, functional, and psychological studies.

Problems of typology have, however, been already spoken about in this Symposium.

The question what brings anthropology into direct relationship with sport and sports medicine may be answered in the following way: first of all, new and accurate somatometric methods. However, we must add that it is necessary to take care that accuracy is really respected. There are few branches where anthropological methods would be used so much as just in physical culture. Very many measurements carried out recently are being performed by willing amateurs, and accordingly these results have got to be evaluated.

The introduction of calipers into medical practice in physical culture is a contribution of great importance. Medical control of sportsmen requires, more than any other branch of science, an exact knowledge of the mutual ratio of the active body mass and the body fat.

An objective appraisal of the posture, recording of the rachigram and its goniometric evaluation is of extraordinary value for practical sports medicine, as particularly sportsmen require, from the viewpoint of prevention, much attention in this respect.

The methodology of plantograms and their mathematical treatment have become an indispensable component of examination of every sportsman that comes to our Institute to be physically examined.

Of much use is the cooperation in the sections of growth study and physical maturity of young sportsmen, also by means of determining the bone age. This has yielded interesting results.