



Femininity tests at the Olympic Games

by Dr. Eduardo Hay

Dr. Eduardo Hay is professor of gynaecology and obstetrics at the Faculty of Medicine in Mexico. A member of the IOC's Medical Commission for many years now, he was among those responsible for devising the first femininity tests for women athletes at the Olympic Games, and he is an authority on the subject.

He is at present first Vice-President of the Mexican NOC, after being a member until 1969. At the Mexico Olympics, he was responsible for the general coordination of ceremonies and protocol, at the same time occupying the post of Director General of the "Centro Deportivo Olimpico Mexicano".

It is important for the understanding of this article to stress the title "Femininity tests at the Olympic Games", for the instructions issued by the IOC to its Medical Commission are exclusively sporting in their aim and in no way seek to open up a scientific discussion of the matter.

Today, nationalism or the need for certain political ideas or systems to assert themselves by victories has encouraged some athletes to take drugs in order, supposedly, to improve their performance, with complete disregard of the immediate or remote dangers incurred as a result of the absorption of these drugs. Baron Pierre de Coubertin's noble ideas are, unfortunately, forgotten, for some people feel the need to seek victory at all costs, even to the detriment of the athlete's health and in violation of the accepted rules.

In certain cases, women athletes have derived advantages from certain anatomical anomalies.

Such anomalies, without depriving her in any way of her social or psychosocial status, give the woman athlete endowed with these masculine anatomical conditions, an unfair and unlawful advantage over the anatomically normal woman athlete.

The women's liberation movement is very much in the news today, and, in all spheres of activity, women are demand-

ing equality of position, responsibility and salary.

Women are fighting against all discrimination, but fortunately still cling to their gifts of beauty, grace and maternity as endowments exclusive to them.

Equality in sport has not been simple to gain; however, whereas at the Olympic Games in Paris in 1900, out of 1,066 athletes, only 6 were women, in Munich there were 1,070 women athletes.

Between men and women there are differences, among them anatomical ones, which lead to different results depending on the effort and the resistance demanded by various sports.

The records set by men are as a general rule 10 to 20% higher than those set by women. In athletics, the figure varies between 10 and 18%. In swimming, where the average age of competitors is sometimes very low, there is nevertheless a difference of 10%, and even 18% in the butterfly and backstroke, where greater muscular effort is demanded.

It has been proved that these differences have an anatomical cause. And this is what incited the International Olympic Committee, in agreement with the International Sports Federations, to ask for femininity tests to be carried out at the Olympic Games. The first tests were made at the 10th Winter Olympics in Grenoble, in 1968. A small number of athletes, chosen by lots, were tested.

The results, as well as the value of the method, led to a complete check at the Olympic Games in Mexico in 1968.

The regulations and methods were then laid down on a definitive basis. Today the purpose of the femininity tests carried out on women athletes taking part in the Olympic Games is to make sure that all female athletes compete under identical anatomical conditions.

In cases of hermaphroditism or intersexuality, the athlete in question must be withdrawn, in order to allow the others to compete on "equal terms".

We have had a few problems due to differences of opinion concerning the methods of investigation and the interpretation of the results. We considered that these results could only be of value in the case of a total investigation: hormonal, chromosomal and gynaecological. However, some people proposed different solutions.

In order to understand better what we are talking about, it is important to remember the normal process of sexual differentiation and the elements determining it.

The series of events leading to sexual differentiation can be divided into the following stages:

1. Zygotic determination¹ of the male or female sex from the genosomic complement (XY or XX),

2. Differentiation of the testicles and the ovary from a non-differentiated gonad²,
3. Development of the internal male or female genital organs from the Wolffian or Müllerian ducts³ which coexist in the same embryo,
4. Differentiation of the external male and female genital organs from embryonic structures common to both sexes,
5. Appearance at puberty of the corresponding sexual characteristics, as well as gametogenesis⁴.

The first four stages occur before birth. At the time of birth they will determine to which sex the newborn will belong. In the post-natal stage will be added the effects of education, which guide the child towards his or her genetic identity.

It should also be emphasized that the embryonic differentiation of the internal and external genital organs depends on the testicular tissue, for it appears that as far as this is concerned the ovarian tissue plays no part.

It is generally accepted that, in the first stages of morphogenesis⁵, the testicle produces at least two different types of substance, one that stimulates the Wolffian ducts, the other that is believed to inhibit the Müllerian ducts; these substances exert only a regional action, limited to the sexual gonads. At



"Hermaphrodite asleep"

a later stage, the masculinization of the external sexual organs depends on the presence of androgens⁶, secreted by the foetal testicle, or, in certain pathological cases, by the cortex of the suprarenal gland.

It can be understood then how, in the absence of testicles and during the process of sexual differentiation, the Wolffian ducts do not develop, the masculinization of the external genital organs does not occur and the Müllerian ducts become oviducts, their regression not taking place.

It is clear therefore that the absence of testicles determines a development in the female direction, without this development being connected in any way with the possible presence of the ovary.

If therefore the working of the foetal testicle is deficient, there will be an ambiguity of the internal and external genital organs. The degree of this ambiguity will vary according to the time and extent of the testicular deficiency.

As none of the existing classifications of these cases of intersexuality is completely satisfactory, we, for our part, select the one established by Klebs, in 1876, although the terminology is not altogether correct.

Klebs divided these cases of intersexuality into three main groups:

- masculine pseudohermaphroditism,
- feminine pseudohermaphroditism,
- true hermaphroditism.

The first of these terms indicates the existence of internal and external genital structures incompletely or incorrectly differentiated, the gonads possessing histologically⁷ the characters of an incompletely developed testicle.

Feminine pseudohermaphrodites, on the other hand, present no anomaly of the internal genital structures, only an ambiguity of their external genital organs.

The individuals mistakenly called true hermaphrodites possess a differentiation of the medullary and cortical portions of the primitive gonad. It is therefore the degree of functional capacity of the foetal testicular tissue that will determine the degree of masculinization of the internal and external genital organs. But, in order to place a person in this category

It is necessary for a clearly differentiated testicular and ovarian tissue to be present in the gonads of this person at the same time.

The majority of the entities grouped under the general heading "intersexual states" come under these three groups. To these should also be added the mixed gonadal dysgeneses, characterized by an ambiguity of the internal and external genital organs.

If the Medical Commission of the International Olympic Committee had wanted to satisfy everybody, we would undoubtedly, at the present moment, have Olympic Games divided into chromosomal groups. For it is easily forgotten, at this stage, that the sole purpose of the Medical Commission in this investigation of femininity, is to ensure the physical equality of the women athletes competing against each other.

The Medical Commission has therefore looked for an effective method of investigation, easy to carry out, inexpensive and one that at the same time ensures the minimum of physical and psychological disturbance to the athlete.

This method is as follows:

- A first general selection based on the detection of the X and Y sexual chromosomes (chromatic investigation for the X's, fluorescent method for the Y's).

— In case of an incomplete or unsatisfactory result, establishment of the karyotype (complete chromosomal picture).

The first test is carried out by taking a sample of the buccal mucus or the root of a hair.

The taking of a blood sample and a gynaecological examination are carried out when there is an obvious anomaly.

These analyses are always carried out before the Games start so that if an anomaly is detected, the athlete in question may be notified in time and excluded with all the desired discretion. In fact, the results obtained remain strictly confidential and only the members of the Medical Commission carrying out the tests and the doctors appointed to help them by the Organizing Committee, with the approval of the Medical Commission, have access to these results.

Once the anomaly is detected, the athlete concerned must withdraw, but nobody, not even the members of her team, may know the reason.

The people who, by their function, are necessarily acquainted with the results (Medical Commission, assisting doctors, etc.) are bound by the strictest professional secrecy.

Each athlete who has passed the tests receives a certificate of femininity signed by the President of the Medical

Commission of the International Olympic Committee. This certificate is valid for all other amateur sports contests.

Dr. E. H.

¹ **Zygotic:** from the Greek zygos egg. At the moment of fertilization, the ovule (X) and the spermatozoid (X or Y) fuse to form an egg. From this moment on, the sex is determined: X + X: XX (female) or X + Y = XY (male).

² **Gonad:** the original egg divides very quickly and produces a certain number of primitive cells called gonads. Each gonad will give birth to a particular organ.

³ **Wolffian and Müllerian ducts:** Wolffian ducts give birth to the internal male genital organs (spermiduct in particular), Müllerian ducts to internal female genital organs (Fallopian tubes, oviducts, uterus). These embryo ducts were discovered by Müller, an American biologist, Nobel Prize for Medicine in 1946.

⁴ **Gametogenesis:** production of male or female gametes (in the human being, spermatozoids and ovule).

⁵ **Morphogenesis:** division of the embryo cells resulting in the formation of a perfect being.

⁴ **Androgens:** hormones producing male sexual development.

⁷ **Histology:** descriptive study of cellular tissues.

The Medical Commission, presided over by Prince Alexandre de Merode, IOC member for Belgium, will meet on 5th, 6th and 7th April 1974 in Innsbruck.

ERRATUM: In No. 68-69, p. 252, 2nd column, 3rd paragraph, read: "*The IFs' rules should conform to those of the IOC as contained in its doping brochure.*"