

An Artistic Anatomical Study on Equine Pose Representation in the Fine Arts

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In this paper, the kinds of equine poses on 267 fine arts in the world were analyzed in comparison with the actual phases of equine locomotion using original reference plates.

In making the reference plates, the locomotion of several actual horses in various gaits were recorded by VTR camera. And, the actual poses of the horses were drawn up for each frame, then, all the phases were broken down into the combination of the kinds of landing legs and made into reference plates. Each of the samples in the fine arts were compared with the plates in order to judge the gaits and phases from the viewpoint of the combination of the kinds of landing legs, the arrangement pattern of the four legs and the general posture.

The results show that the general tendency of all samples, 222 samples (83% of all samples) could be located in any phase of the reference plates. And, in considering the value of frequency of representation, the favorite poses in the fine arts could be classified into the following several groups: the pose at standing on hind legs the pose at landing of diagonal legs at trot the pose of the leaping gallop or the leap pose in the same phase with all four legs airborne the pose at landing of a foreleg and both hind legs at walk, and the pose of the leaping gallop or the leap pose in the same phase at landing of both hind legs or, poses resembling them.

Furthermore, from the results of investigation of the tendencies by areas or periods, some interesting problems were found especially when discussing about the 'difference between artistic representation and actual facts' (which is called "Poetical Reality" in the artistic anatomical field).

Key words: artistic-anatomy, equine representation, pose

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In the last paper [9], equine representation in the fine arts of the world were investigated from the viewpoint of realism of the relief, and reported peculiarities of each area or period.

Along with relief representation, many studies have been made on the serious problems about poses in the fine arts in the artistic anatomical field [1, 8, 12]. Yet, only few studies on equine pose in the fine arts have been made, for example, a study about Greek arts by Markman [3], and a study on Zuijin Teiki Picture Scrolls by Nakao [6]. Also in these studies, a detailed comparative

research was not made between represented poses in the fine arts and actual horses. On the other hand, although 'Animals in Motion' by Muybridge [5] in which equine gaits were fundamentally classified or 'Points of the Horse' by Hayes [2], which is a book on hippology, dealt with equine poses in the fine arts but, from the nature of these books, these were treated in a brief and incidental manner.

In this paper, on the same samples which were analyzed in the study about equine relief, a comparative study was made between equine poses represented in the fine

arts and actual equine locomotion in clarify tendencies by areas and periods of order to equine poses favored by artists of the world and, at the same time, study the existence of the representation technique called "Poetical Reality" and its significance in the fine arts.

Materials and Methods

Samples. Analyzed were 267 equine representations which are appraised as principal works in the fine arts. These samples were from periods extending from the Stone Age to the Modern, and area-wise, the Orient, the Occident, China and Japan.

Reference plates. Before analysis of the samples in the fine arts, several actual equine locomotions were analyzed. The experiment horses were eight moderately trained dressage or jumping Thoroughbreds and Anglo-Arabs, a Quarter Horse and 2 Kiso (native-bred) horses. Their locomotions were taken by a 30 Hz movie camera (Victor videomovie GR7) and then these actual poses were traced on paper for each frame. The traced poses consisted of half strides at walk (W) and trot (T), a stride at canter (C), gallop (G), leaping gallop (LG), and the leap (L) from takeoff to landing. As shown in Fig. 1, in each phase, the areas enclosed by straight lines connecting the successive movements of the four fetlocks and the abdomen configuration were painted in black color which made clear the arrangement pattern of the four legs. And, as shown in Fig. 2, for each gait, the combination of the kinds of landing legs for each frame were studied.

And, in regards to gallop, leaping gallop, passage and piaffe, the existing VTR obtained from other sources were analyzed.

Analysis of samples in the fine arts. Using these reference plates, the corresponding gaits of the represented equine poses in

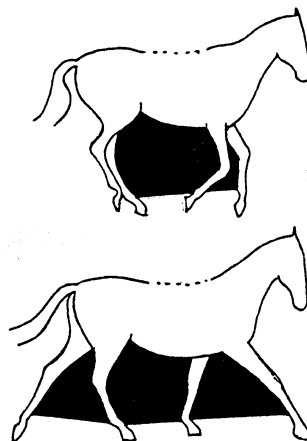


Fig. 1. Samples of phases drawn up from VTR data for reference plates

each sample were judged. During the comparison, attention was directed to the combination of the kinds of landing legs, the arrangement pattern of the four legs and the general posture.

If there was an uncertain landing leg in the represented samples, all were dealt with as landing legs. And, the slight differences between the actual locomotion and the poses in the samples were disregarded. About poses of standing on all legs (4s-S) or on both hind legs (2r-ST) were not compared with the actual horses because the peculiarities of these poses were evident and were easy to judge. The poses of passage and piaffe were judged as trot (T). Furthermore, even though the gait was at walk, those poses which were obviously draft from the situation were judged as draft locomotion (D). And, the reference plates for the pace were used in the analysis because the arrangement pattern of the four legs which serve as reference plates in the trot are the same pattern as the pace.

Results

General tendency of all samples and typical samples. Fig. 3 is the totalization of the results of all samples. First, that 222 samples

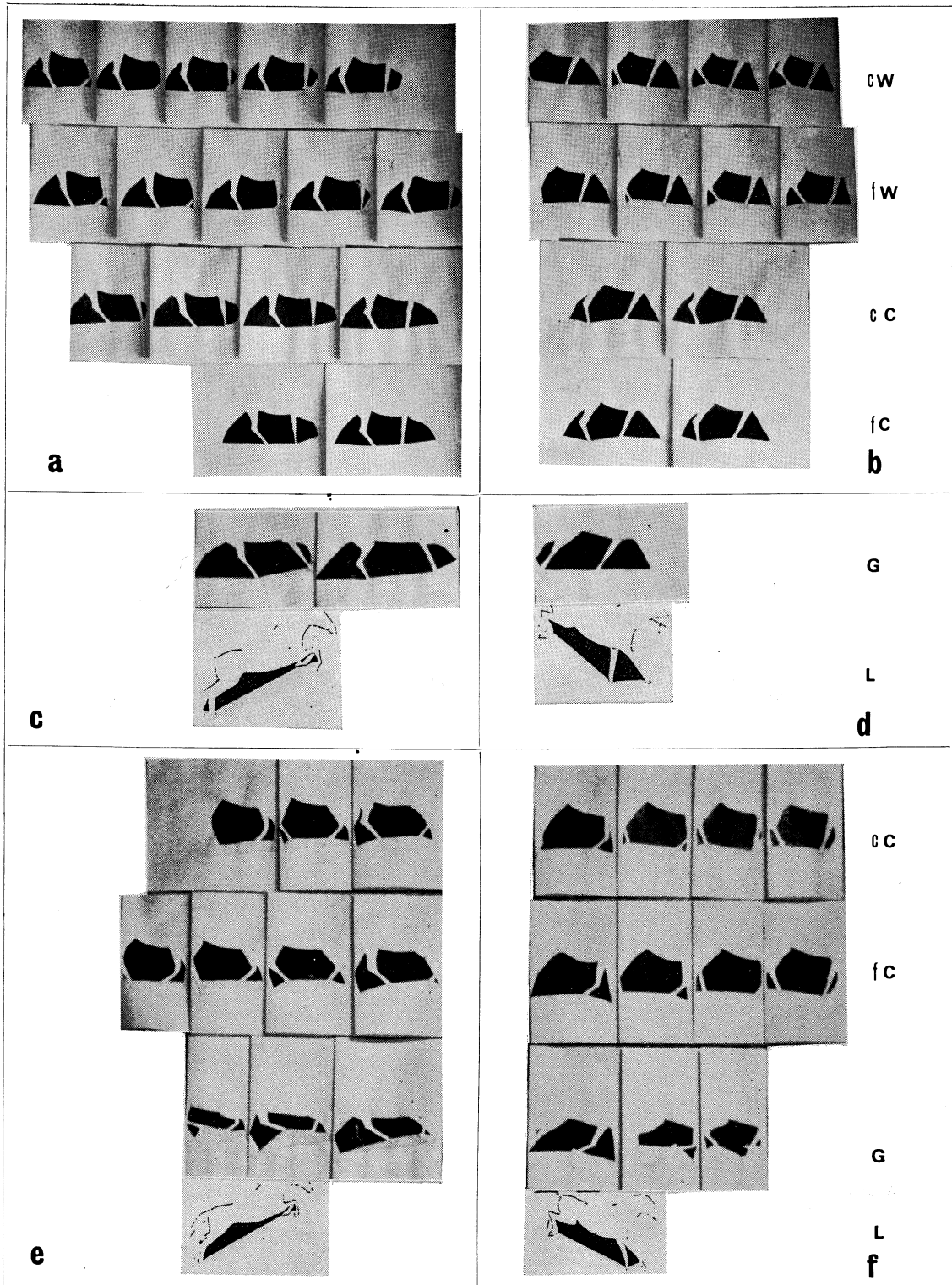
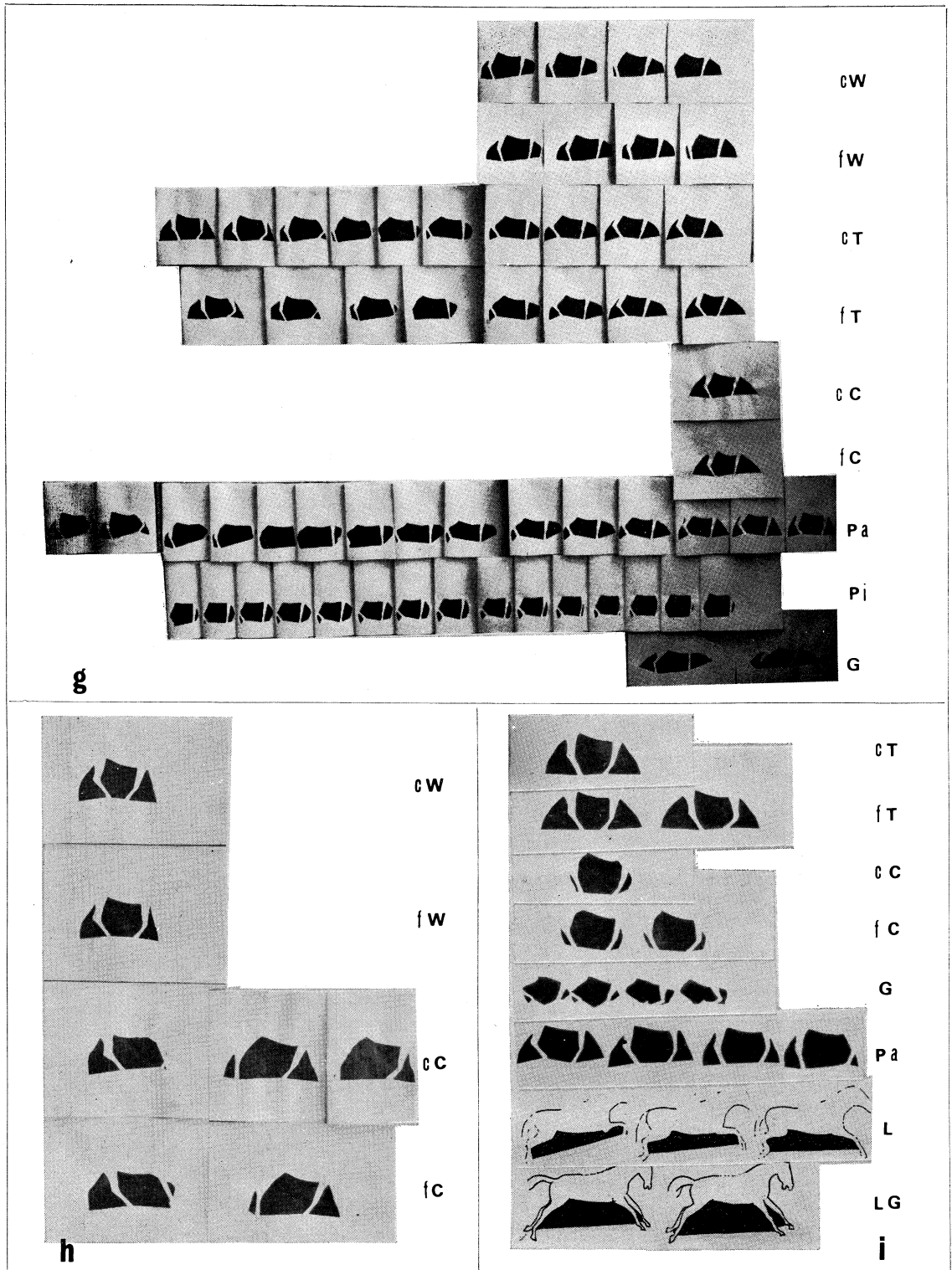


Fig. 2. Reference plates

a; phases at landing of foreleg and hind legs, b; phases at landing of forelegs and hind leg, c; phases at landing of hind legs, d; phases at landing of forelegs, e; phases at landing of hind leg, f; phases at landing of foreleg, g; phases at landing of diagonal legs, h; phases at landing of same side legs, i; phases at airborne/cW; collected walk, fW; fast walk, cT; collected



trot, fT; fast trot, cC; collected canter, fC; fast canter, Pa; passage, Pi; piaffe, G; gallop, LG; leaping gallop, L; leap/In the leaping gallop, only phases at airborne are shown, but phases at landing of hind leg/legs or foreleg/legs exist./When analysis of samples, passage and piaffe are included in the trot, and some other actions; the standing still, the standing on hind legs, the pace and the draft are added.

(83% of all samples) could be located in one of the reference plates used in this investigation. Next, that it was possible to classify the poses frequently used in the fine arts. In the order of the frequency of representation, the pose of standing on hind legs (2r-ST) was 44 samples (16% of all samples), the pose of landing of diagonal legs at trot (2d-T) 37 samples (similarly 14%), the pose of the leaping gallop or leap with all legs airborne (ab-LG/L) 30 samples (similarly 11%), the pose of landing of a foreleg and both hind legs at walk (3r-W) 15 samples (similarly 6%) and the pose of the leaping gallop with landing of both hind legs or the leap pose in the same phase (2r-LG/L) 13 samples (similarly 5%) or poses resembling these. The samples shown in Fig. 4 are good examples of these useful poses in the fine arts. Furthermore, also observed was the pose of the foreleg and both hind legs (3r-S, 6 samples) at standing or the pose of landing on all four legs (4s-W, 8 samples) at walk and, though limited in area, relatively used were the pose of landing of one leg at canter or gallop (1r-C/G) and the pose of all legs airborne (ab-P) in the pace. On the other hand, some poses were scarcely ever used in the fine arts, although they actually exist in actual horses. These are the pose of landing on all four legs (4s-C) at canter, the pose at landing of both forelegs and one hind leg (3f-W, Fig. 5-a) at walk or the same phase in the canter (3f-C), the pose of landing of diagonal legs (2d-C/G) at canter or gallop, the pose of landing of both forelegs (2f-LG/L) in the leaping gallop or leap and the pose of the landing of a foreleg (Fig. 5-b) at canter or the leaping gallop or leap (1f-C/LG/L) in the same phase. In these poses, in common were the poses with the body weight load more on the forelegs than the hind legs.

	L	LG	G	C	ST	P	T	D	W	S	E	Total	%
a d	■	■	■	●	●	■	■				■	48	18.0
1 f				●			●					2	0.7
1 r		●	■	■	■	●					■	21	7.9
2 f			●								●	2	0.7
2 r	■	■	■	■	■						■	64	24.0
2 s				■	■	■			●		■	15	5.6
2 d						■	■		■	■	■	52	19.5
3 f							●			■	■	9	3.4
3 r				●		■	■	■	■	■	■	38	14.2
4 s								●	■	■	■	16	6.0
Total	16	28	11	12	49	15	46	2	30	13	45	267	100.0
%	6.0	10.5	4.1	4.5	18.4	5.6	17.2	0.7	11.2	4.9	16.9	100.0	

Fig. 3. Gaits and kinds of landing legs by analysis of all 267 samples

(■; 10 samples, ●; 1 sample)

L; leap, LG; leaping gallop, G; gallop, C; canter, ST; standing by hind leg (or legs), P; pace, T; trot, D; draft, W; walk, S; standing, E; et cetra, /ab; airborne, 1f; at landing of a foreleg, 1r; at landing of a hind leg, 2f; at landing of both forelegs, 2r; at landing both hind legs, 2s; at landing of same side legs, 2d; at landing of diagonal legs, 3f; at landing of both forelegs and a hind leg, 3r; at landing of a foreleg and both hind legs, 4s; at landing of all legs.

Tendency of each area or period. The tendency of each period and area is shown in Fig. 6. Of all samples, the 2r-ST pose was the most frequently used in nearly all areas and periods. Particularly, in the Occident, from the Renaissance to the 19c, this pose was more prominently used than other poses. However, in China and Japan, though this pose was used, it was not prominently used. In these areas, the poses used prominently in China were the airborne phase of the leaping gallop or pace ('ab-LG/P') and, in Japan (to the Edo Period), the landing of diagonal legs at trot (2d-T) or the airborne phase at the leap ('ab-L').

The second frequently used pose in general was the landing of diagonal legs at trot and this pose appeared in every area or period with the exception of the Stone Age, Ancient Orient, Early Greece and

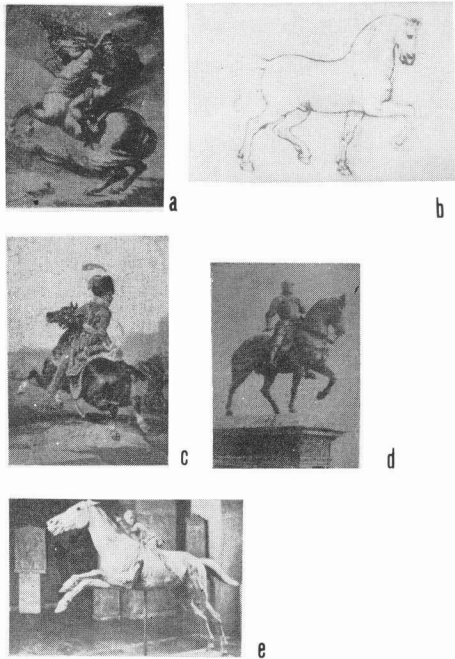


Fig. 4. Some samples on the analysis

a; Napoleon I by David. A sample of pose at standing by hind legs. b; A study of horse by Leonard da Vinci. A sample of pose of landing of diagonal legs at trot. c; A hunting officer by Gericault. A sample of the pose of the airborne at leaping gallop. d; An equestrian general Clleoni by Verocchio. A sample of the pose of landing of a foreleg and both hind legs at walk. e; A boy on the horse in ancient Greece. A sample of the pose of the landing of both hind legs at leaping gallop.

Ancient Greece•Rome.

Third, irrespective of period or area, the third frequently used pose, the airborne leaping gallop or leap (ab-LG/L) was used in areas and periods other than the Stone Age, Early Greece, Ancient Greece•Rome and the Occident in the Middle Ages and the Byzantine Period. Especially, in China and before the Edo Period in Japan (to the Edo Period), Ancient Orient and the Occident in 19c, these poses were very conspicuous.

The fourth frequently used pose (3r-W) of the landing of a foreleg and both hind legs at walk, and, if standing (3r-S) with the landing of one foreleg and both hind

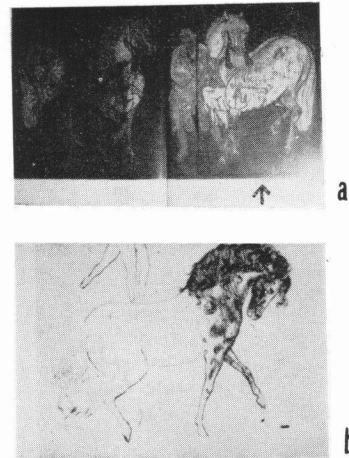


Fig. 5. Some samples with rare pattern of legs

a; Shinme-Zu. by Kanoh Motomobu. A sample of pose of the walk at landing of both forelegs and a hind leg. b; In the Circus. by Picasso. A sample of the pose of the canter at landing of a foreleg.

legs, which greatly resembles the 3r-W as morph in the fine arts were included, this pose appeared in nearly all areas or periods. However, this does not mean that this pose was prominently used over other poses. Furthermore, the pose (4s-W) of all four legs on landing at walk, which greatly resembles the 3r-W pose as morph in the fine arts, was used frequently in the Ancient Orient and Ancient Greece•Rome.

The fifth frequently used representation pose of the leaping gallop or leap on landing of both hind legs (2r-LG/L) appeared in the Ancient Orient, Ancient Greece•Rome and the Renaissance. In the fine arts, in comparing these poses with the posture (2r-ST) which is similar but with a more collected equine body standing on both hind legs. In the Ancient Orient, almost the same number of 2r-LG/G and 2r-ST samples were used but, in the Renaissance, the 2r-ST was used much more than 2r-LG/G, and furthermore, also in the Greece•Rome Period, the 2r-ST was used much more than the 2r-LG/G and the standing on one hind leg (1r-ST) was used the most. This

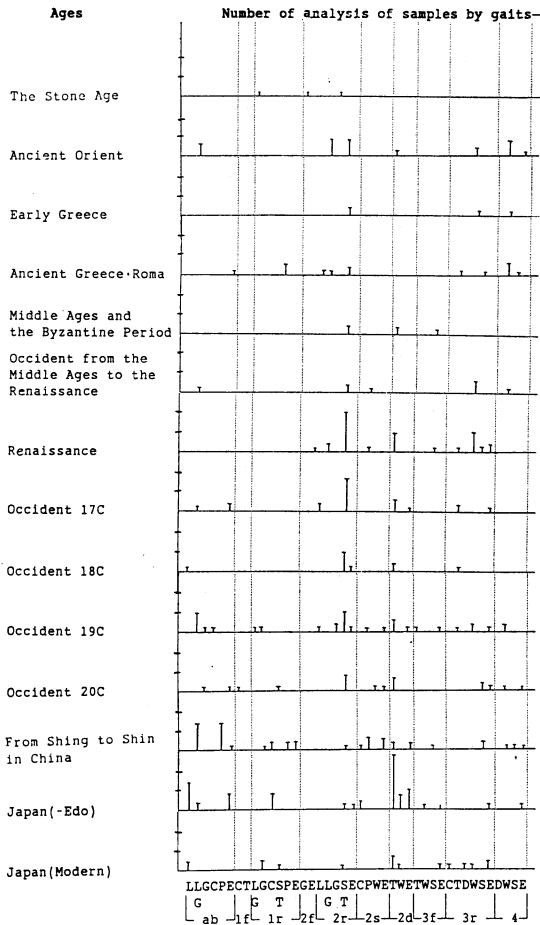


Fig. 6. Gaits and kinds of landing legs of samples in the each era or period
 One division of the vertical scales indicates 5 samples.

1r-ST pose appeared in the Stone Age, the Occident in the 19c and 20c and also in China and Japan.

In the Occident in 19c and 20c, and Japan in the modern period, there were no fixed tendencies in equine pose representation so various poses were expressed free from conventional poses.

Discussion

In the result of analysis of 267 equine pose representations in the fine arts all over the world compared with actual equine locomotion, 222 samples (83% of all samples)

could be located in one of the actual equine locomotions. And, furthermore, 52% of all samples corresponded to one of the poses of standing on both hind legs, landing of diagonal legs at trot, the airborne leaping gallop or leap with the forelegs extended forward and the hind legs extended backward, the landing of a foreleg and both hind legs in the leaping gallop or leap.

Though the pose of standing on hind legs, which was the most frequently used in representation, was not a pose which could not be normally observed often but, by condensing the dynamic propelling power of a static horse until its forequarter is ultimately lifted upward, this pose represents the feeling of vitality or spirit [10]. This kind of pose was dealt with as the acme of equine collected posture [4] on classic equitation in the Occident and this pose has been handed down to this day by the Spanish Riding School in Wien as equitation performances of Rubert or Pusert. From the 17c to the 18c in the Occident, this pose was favored as a symbolic representation in the portraits of heroes and the nobility. In the background, the existence of such equitation reasons are undeniable but, furthermore, the feeling of vitality or spirit of this pose also became suitable motif in expressing authority or dignity of the represented persons.

The pose of the landing of the diagonal legs at trot was also used quite frequently but, in this pose, in the case the landing legs are vertical to or stretched forward of the ground, this generally gives the strong impression of 'standing' or 'stopping' and, conversely, in the case the landing legs are stretched backward of the ground, this often expresses the feeling of 'orderly progression' [10]. In this pose, due to variations such as the articular angles of each leg or the joint flexion of the fetlocks, etc., it is

possible to express comparatively dynamic and static appearances. In thinking of how the fast trot has fascinated viewers as seen in the dressage which retains the orderly beauty peculiar to the diagonal gait, the pose must certainly have been an attractive pose to artists who depicted horses. This pose also frequently appears in Japanese Picture Scrolls of Battle Scenes, etc., but, if man and horse in an extremely tense situation, were to engage in a life-and-death close combat, it was not difficult to imagine that the trot gait would be preferred much more than the canter which is difficult to control. Here, symbolic was the trot posture of the hind legs extremely forward so that the forequarter would be lifted but, in doing so, this pose projected the same vitality impact as the pose of standing on the hind legs.

Prior to the scientific analysis of the equine gait, the pose of the airborne leaping gallop or leap with the forelegs extended forward and the hind legs extended backward had been the conventional expression of the gallop both in the Occident and the Orient [5]. But, as a result of photographic analysis of equine gait by Muybridge, it became clear that, normally, this pose does not actually exist in the canter or the gallop. In the condition where the four legs are extended forward and backward, it is normal for at least one leg to be in contact with the ground. This imaginary pose where the horse body is extended forward and backward and flying through the air which man has imagined as the running figure of a horse certainly aptly expresses the speed of the horse. By the author's tachistoscopic study [11] of how human perceptions interpret the action of running animals, in the case of the canter or the gallop, vividly characterized were the legs extended forward and backward but the

tendency was pointed out that the legs under the abdomen were hardly characterized. Such characteristics of human perception might have influenced the artistic representation before the development of the photographic technique.

The pose of the landing of a foreleg and both hind legs at walk or the pose of the leaping gallop or leap at landing of both hind legs were relatively used but, from the point of 'statics' and 'dynamism' both presented a striking contrast. The pose of the walk can naturally express the static or stable image by itself but, by adding a forward incline to the landing foreleg, it was possible to express the image of 'potential spirit of progress' or 'commanding presence'.

On the other hand, the pose of the leaping gallop or leap at landing of both hind legs, leads to a feeling of instability but, at the same time, on the contrary, this actually contributes to express the feeling of speed and vitality.

These poses which have a relatively high value of frequency in representation, all poses have the characteristic of a large body weight load on the hind legs. As it has been scientifically proven that the hind legs in all four-footed animals have the function of propelling power, by artistic expression of these poses, perhaps the artists, consciously or unconsciously, intended to express this strong propelling power of the horse. Moreover, by raising up the forequarter, efforts could be seen to further express the feeling of vitality. Furthermore, by adding the airborne pose, it was readily understood that, in expressing the horse, 'speed' was also indispensable. The fact that these poses were frequently used indicates that the horse is the motif of the fine arts, regardless of the area or the period, which have, in common, 'dynamism'

and 'force'.

On the other hand, the reason why the pose of the weight load on foreleg is shunned more than on the hind legs in the fine arts is because this pose conveys the image of a braking function of the forelegs. However, as the forelegs have the function of controlling the balance of the forelegs, this pose is more suitable in the case of stressing 'stability'.

In either case, prior to the scientific analysis of the functions of the forelegs and hind legs of the horse, it is absolutely certain that the differences between the forelegs and the hind legs of the horse were recognized as comparatively correct based on the image observed with the naked eye and through intuition.

In the modern period, the poses of equine representation have become diversified and there has been an increase of samples whose poses would not always correspond to the typical 5 poses. This matter may not be unrelated to the fact that actual equine motions are being increasingly clarified through the use of movies and VTR. It is possible to easily grasp the actual action through photographic still pictures, even in regards to complicated actions. From the point of reality of action, it is absolutely certain that these samples are greatly superior to the past representations. However, on the other hand, if the degree of reality was the only significance of artistic expression, then, it would not be possible to excel photographs. It is believed that above all, the most essentially important element in the fine arts is not to make exact representations of the actual object but it is to extract only the image to meet the expectations of the artists or viewers so that the fine arts would appeal to viewers sensibility or intuition. From this point of view, the flying pose of the airborne leaping

gallop or leap with the forelegs extended forward and the hind legs extended backward is truly a typical representation of the fine arts which expresses the motif image without being a slave to the actual motion.

Nakao [7] indicated the importance of 'Poetical Reality' about human figure representation but, also in equine figure representation, this representation technique has been adopted. There appears to be a necessity to reconsider this technique which is important to the fine arts, by setting apart photography and the VTR which conveys the actual object as it is, that is, 'in the fictional world of art, to emphasize the intentions of the artist by adopting the true-to-life make believe' technique.

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美術解剖学から見たウマのポーズ表現——柴田真美（文化女子大学家政学部服装デザイン学研究室 〒151 東京都渋谷区代々木3-22-1）

本研究では、体表のレリーフ表現について調べた前報に引き続いて、古今東西の造形作例（267 作例）に描かれたウマのポーズについて、独自の指標を用いて実際のウマの歩行運動中の位相と比較し、その表現方法の特性について検討した。

分析指標を作成するために、数頭の実馬に各種の歩行運動をさせ、それを VTR カメラで撮影した。その映像からウマの動作を 1 コマ毎 (30Hz) に作図し、こたらの位相を着地肢の組合せによって分類し、作例分析のための指標とした。各作例について、そこに描かれたウマの着地肢の組合せ、四肢の配置パターン、そして全体の姿勢、の 3 つの視点から分析指標と照合し、描かれた歩法とその四肢の位相を判定した。

その結果、全体の 83% にあたる 222 作例が、分析指標のいずれかの位相に分類する事ができた。また、描写頻度の高さから判断して、造形上で好まれるポーズは、次に示すグループとして捉えることができた；両後肢で立ち上がっているポーズ、対角前後肢が着地している速歩のポーズ、四肢全てが地から離れているリーピングギャロップもしくは同じ位相の飛越のポーズ、一方の前肢と両後肢が着地している常歩のポーズ、両後肢が着地しているリーピングギャロップもしくは同じ位相の飛越のポーズ、の 5 ポーズ、あるいはこれらに類似したポーズである。一方、造形表現上であまり用いられないポーズは、四肢すべてが着地している駈歩のポーズ、両前肢と一方の後肢が着地している常歩もしくは同じ位相の駈歩のポーズ、対角前後肢が着地している駈歩もしくは同じ位相の襲歩のポーズ、両前肢が着地しているリーピングギャロップもしくは同じ位相の飛越のポーズ、一方の前肢が着地している襲歩、同じ位相のリーピングギャロップ、もしくは同じ位相の飛越のポーズであった。

さらに、時代あるいは地域別にその作例を検討した結果、美術解剖学の分野で「詩的真実」と呼ばれている「造形表現と実体との相違」について考察する際に大変興味ある問題がいくつか提示された。