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Appearance of *Hipparion* in the Tertiary of the Siwalik Hills of North India, Kashmir and Pakistan

SIMONS *et al.*¹ have discussed the earliest occurrence of *Hipparion*, a tridactyl fossil equid, in the Tertiary of the Siwalik Hills (Pakistan and India). Their statements are confusing and they have misinterpreted one of my publications. Simons *et al.*¹ reject a possible Chinji occurrence of the genus, partly because "Hussain has pointed out that regardless of the validity of occurrence of the *Hipparion* reputed to have been found near the base of the Chinji, the teeth of these specimens are very large. It is implausible that such animals should have preceded in time the small and structurally different species *Hipparion nagriensis* Hussain".

This is a misinterpretation of my work², in which I clearly stated that the presumed Chinji *Hipparion* teeth cannot be morphologically distinguished from those of the Nagri and Dhok Pathan. *H. nagriensis* from the Nagri Formation is no more primitive than the two Dhok Pathan species (*H. theobaldi* and *H. antilopinum*) in dental pattern or size, but it does differ in cheek tooth hypsodonty and especially in certain functionally important features in the structure of the foot. These characters serve to distinguish *H. nagriensis* from *H. theobaldi* of the Dhok Pathan, which Colbert³ had considered to be present from the lower Chinji through the Dhok Pathan Formations. Simons *et al.*¹ have attributed the same stratigraphical range to *H. antilopinum*, which has never been reported except from the Dhok Pathan Formation; they have thus confused this species with *H. theobaldi* and further clouded an already over-complicated issue. In fact, both of these more advanced Siwalik hipparions (*H. theobaldi* and *H. antilopinum*) are on present evidence restricted to the Dhok Pathan Formation. Neither can be said to be more primitive than the other, but they are separated by size differences^{2,3}, and both seem to be derived *in situ* from *H. nagriensis*².

The presence of *Hipparion* in the Chinji Formation is still uncertain. Representatives of the genus may have entered the sub-Himalayan region in latest Chinji or earliest Nagri times. Definite occurrence of *Hipparion* in the Nagri is the most distinctive faunal feature of this time as compared with the preceding Chinji. Similarly, the first local presence of *Hipparion* in the Vallesian of Spain is the most distinctive feature by comparison to the preceding Vindobonian. In the next younger Dhok Pathan Formation, two different species of *Hipparion* are found which have more

hypsodont teeth and more advanced foot structure than the Nagri *Hipparion*². Similarly, several Turolian *Hipparion* species in Europe are more advanced than the typical Vallesian species (*H. catalaunicum*). On this basis, it is possible to suggest tentatively that the base of the Nagri is correlative with the beginning of the European Vallesian and a similar correlation of the Dhok Pathan and the Turolian is here suggested. Such correlations, however, should be confirmed by other evidence such as entire fauna, flora and absolute dates.

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GENERAL

What Children Do in Spite of Adults' Hypotheses

Bryant and Trabasso¹ suggested that Piaget was wrong when he claimed that children below about 6 yr of age are incapable of making transitive inferences of quantity.

They proposed that the difficulty encountered by the children Piaget tested was not one of transitivity but one of memory, and that therefore it was sufficient to overcome this problem with a modified technique to show up the idea of transitivity in young children.

Bryant and Trabasso's attack focused on this summary of Piaget's view of transitivity: "Piaget and his colleagues propose that the young child cannot infer, for example, that $A > C$ from the information that $A > B$ and $B > C$. . . the child is unable to coordinate the first two, separate items of information in order to reach the correct inferential conclusion about A and C ".

If we are interpreting Bryant and Trabasso correctly, they are making an important and legitimate point in emphasizing a more basic aspect of transitivity than Piaget, but we feel that their definition is rather different from Piaget's, and that therefore they cannot be justified in claiming that Piaget was "wrong".

Piaget's "definition" of transitivity²⁻⁵ is linked with the whole structure of his system, and in particular with the idea that, for a judgment to be truly an inference, it must be "operational". For this reason, when Piaget studies transitivity using the seriation task for example, the child is only considered to "succeed" if he can "anticipate" the correct actions; if he has a programme or method to proceed, and thus shows no hesitations; or if he is able to perform modifications of the original task (such as insert a new stick into the already assembled sequence) to show that he has understood the ideas involved.

Thus, by concentrating only on the idea that transitivity consists of the ability to combine two asymmetrical relations to deduce a third, Bryant and Trabasso are discarding the Piagetian concept in which, for a behaviour to be a true inference, the child must be able to make use of it in a constructive and coordinated manner. Their view seems to