

HANNIBAL'S PASS: RESULTS OF AN EMPIRICAL TEST

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(References are to the Bibliography at the end of this article.—EDITOR.)

THREE years, two books,^{1, 2} and a great deal of humorous banter now lie between us and the 1959 British Alpine Hannibal Expedition, which followed the Isère-Arc-Clapier route from 'the ascent towards the Alps' to 'the summit of the pass', on a nine-day time-distance study of Hannibal's route based on the actual progress of an eleven-year-old Indian elephant.

Now that the more sensational aspects of the journey have been forgotten, we have the opportunity to submit for consideration a report of the results of the trial insofar as they offer evidence on the basic problem. We are not unmindful that Professor Wallbank,³ amongst others, has firmly endorsed the view that 'Das Problem ist literarhistorisch, nicht topographisch'. But while we do not argue that one can discover fresh *positive* evidence from a ground survey (unless it be archaeological, an attempt we have made without success to date) we do believe that any serious theory must be consistent with topographical detail; to this degree, an empirical test can eliminate dubious negative evidence. We are heartened, and were originally inspired, by Dr. A. H. McDonald's⁴ challenge which concludes his critical review of Sir Gavin de Beer's⁵ contribution to the long-standing controversy. Dr. McDonald wrote: 'The best procedure would be to take Polybius and Livy in one hand and *Alps and Elephants* [Sir Gavin de Beer's book] in the other, reading the ancient historians first, and travel the Alpine passes, the Durance and the upper Isère.' This was the challenge we met.

Our reasons for believing the Isère-Arc-Clapier route to be Hannibal's are not original and therefore it is more appropriate to give the sources rather than a summary of the supporting arguments. Col. Perrin (1887),⁶ Paul Azan (1902),⁷ J. Colin (1904),⁸ Spenser Wilkinson (1911),⁹ H. Ferrand (1925),¹⁰ Dr. A. H. McDonald (1956), Dr. M. A. de Lavis-Trafford (1956),¹¹ have each favoured a Clapier route, and while they may differ in their approach, they are unanimous on the pass. Dr. Trafford's recent study spells out in greatest detail the eight conditions which must be satisfied by the Hannibalic pass. While the choice of pass can never be separated from the choice of route, the eight conditions do serve as a check list once the overall decision on the route has been taken.

On this overall decision, Dr. McDonald's discussion of the contradictory versions within Livy's account was accepted together with its implications for the crossing of the Rhone and the probability that 'the island' lay at the Isère/Rhone junction. As regards the pass (admittedly only one part of the overall problem), it was ironically the special emphasis given by Sir Gavin to his four reasons for choosing the Col de la Traversette which convinced us the more strongly to favour the Col de Clapier. A glance at Table I will show that although satisfying conditions two, three and four, the Traversette fails on counts one, seven and eight. Sir Gavin admitted that the Clapier fitted his three basic geographic conditions, but ruled it out because it would violate the order in Varro's list of passes. We had lost faith in the accuracy of Varro's list for the reasons given by McDonald. Furthermore when one includes all eight conditions, and not just the three, for one's choice of pass, the claim of the Clapier to the title was with two qualifications strongly convincing.

Our first doubt concerned the reference to snow in the previous year. With scholarly consideration of the change of climate over the ages, Sir Gavin turns a deduction that the pass must be above the present snow line into an argument for the highest pass, snow line or not. The faulty logic was revealed to us by the snow-bare Traversette which we crossed in July, 1956. We could find only two patches of snow, both less than fifteen yards across, which had withstood the summer sun. The alternative explanation, followed by Dr. McDonald and Dr. Lavis-Trafford, that references to 'the old snow remaining since the previous winter' indicate sheltered drifts rather than a complete blanketing, explains the general absence of snow on the Clapier and the Traversette, although it raises some doubts about Polybius' related comment that 'the summits of the Alps and the parts near the top of the passes are *all* quite treeless and bare owing to the snow lying there *continuously* both winter and summer' (Book III, 55: 9). The generality of this remark must be as unacceptable to Sir Gavin as it is to the others, for in whatever sense one interprets Polybius, the uniqueness of continual snow on a particular pass is expressly denied. With the proviso that a satisfactory explanation is found to this last point, our ground studies in 1956 and 1959 suggest that the evidence under the snow requirement (condition 4) points as strongly to the Clapier, despite its lower altitude, as it does to the Traversette.

Dr. Trafford, who places particular stress on the descent via the Col de Savine-Cloche, would argue that the mountain formation along his descent affords even better shelter for snow drifts than the other two passes. Those who accept Spenser Wilkinson's interpretation of the two descent routes may like to consider the merits of the Clapier and the Savine-Cloche, as a pair; they lie about a hundred yards apart.

Our second doubt gave rise to the time/distance empirical test. Convinced that the Clapier matched the historical account on most points, we were not certain that the distance from the rock to the summit would be a reasonable ninth day's march. If Clapier were the pass, there could be little doubt that L'Esseillon must be the 'bare rock'; no other in the area fitted the description so well. But the march between, although shorter in miles than daily marches along earlier parts of the route, involved stretches of climbing where Livy records that 'the elephants could be induced to move but very slowly along the steep and narrow trails'. Consideration of this challenge to the Clapier route was obviously a matter of elephant climbing speeds and of relative distances along the valley and up the slopes. While distances are easily measured, understandably little is known about elephant climbing capabilities above 5,000 feet!

At this point, the expedition obtained Jumbo, an Indian female elephant, eleven years old, weighing $2\frac{1}{2}$ tons. After a twice-weekly training and climbing programme lasting three months, she travelled by train from Italy to Montmélian, Haute Savoie, in France, to join the expedition on July 19, 1959. The record of her march, together with the modern names of the places where we located Hannibal's camping stops along the nine-day march from 'the ascent' to the summit is given in Table II.

The significance of the trial lies in its test of the following hypothesis: 'Would the distances for each day's march along the Clapier route require approximately equal marching times for an elephant?' Our reasoning was that if for one elephant the daily marching *times* were about equal, one would have fairly good confirmation that the landmarks we identified along the route came at about the right intervals. And in particular, one might have more confidence for believing that the bare rock, 13.7 miles from the summit, was not at a prohibitive distance but fairly within Hannibal's marching range for the ninth day. Note that the argument did not depend on our elephant being identical to Hannibal's, nor on the performance of one elephant alone being the same as that of thirty-seven together. We were comparing *Jumbo's* speed over the earlier sections relative to *Jumbo's* speed over the later. We recognised, of course, that changes in terrain and differences in the weather (we crossed in July, Hannibal in October) might affect the result, but for these we could not devise correction.

Our journey could never be a proof; it was, and can only be, an empirical test. But we believed that our findings while minor in comparison with the evidence *literarhistorisch* were a positive contribution to the solution of the problem.

A point of interest was discovered from the text when plans were being made for the test. While considering the Army's movements on

the eighth night, it seemed possible that the pack train and cavalry had advanced through the night, while Hannibal waited to defend his position on the 'bare rock'. The Greek in Polybius indicates that this may have been so. Military strategy might indicate as much. Was there any reason for the baggage to wait underlying the gorge? Was it not better to get clear of so vulnerable a position? More positively, it is clearly recorded that Hannibal's forces were divided and that he only rejoined them the next day. Thus the idea of a night march for the slower section of Hannibal's forces took hold and was incorporated in our reconstruction.

The reconstructed march went according to plan for the first 85.6 miles to Le Planey, at which point we decided not to continue up the final five miles up the Crosta to the Clapier Pass itself, because of the possible risk involved to the elephant on the narrow path. It will be recalled that Hannibal himself did not reach the summit without loss and while his objective may have justified the sacrifice, we felt more hesitant when weighing historical investigation against the misfortunes of a spill. Accordingly we followed a detour down again to the valley (via Bramans and Termignon) and ascended via the Forêt d'Arc to cross the Alps by the Grand Mont Cenis, four miles north-west of the Clapier. While this diversion meant that Jumbo was never climbing above 7,000 feet it did give us double opportunity to time her on climbs below this altitude.

Whether the night march is accepted or not, the record of Jumbo's performance clearly answers any doubts concerning the feasibility of the ninth day's climbing. Both to Le Planey (from 3,760 to 5,430 ft.), and on the detour from Termignon to the Mont Cenis (from 2,300 to 6,893 ft.), Jumbo's progress was little affected by altitude (at 2.6 and 2.9 m.p.h. compared with her usual 3.0 to 3.3 m.p.h.). If Hannibal's army, including his pack train and elephants, maintained the speeds recorded over the earlier sections of the route, no reason of altitude or climbing difficulty should have prevented them from attaining this slower speed during the last day's climb.

With the conviction that these results offer further support to the basic evidence for the Clapier route which we had already considered, we advanced the following tentative conclusions concerning the final section of Hannibal's route.

(a) Hannibal's average day's march, assuming our landmarks were located correctly on the Clapier route, from 'the ascent' to the 'bare rock' was 12.8 miles. The longest was 17.7 miles, and the shortest 10.2 miles, on the half day of the parley.

(b) The bare rock is at L'Esseillon. From the rock to the summit camp (the most likely spot is by the Grange on the French side, 1½ miles from the pass) is only twelve miles.

(c) Over the last lap the extra hours afforded by the night march would have benefited the slower animals.

(d) Our experiments with Jumbo offer no reason to doubt that the route we have outlined would be quite consistent with the climbing capabilities of Hannibal's elephants.

We freely admit that none of this amounts to anything radically new. But we do believe that it does add one further point in favour of the claims of a Clapier route and removes one possible objection from its opponents. And while the significance of the test, and for that matter the importance of the dispute, are in the lighter tradition of classical studies, it may be fair to record that while never claiming that this was the first time an elephant had travelled this route, the expedition did believe that it was the first time for the last 2,177 years.

TABLE I
Conditions

(Five marks are awarded to a complete fit and less for more doubtful cases. Altitude in feet at sea level.)

	Little St. Bernard Pass (7179 ft.) (6893 ft.)	Col du Grand Mont Cenis (7150 ft.)	Col du Petit Mont Cenis (8173 ft.)	Col de Clapier (6083 ft.)	Col du Mont Genèvre (5900 ft.)	Col de l'Echelle (7014 ft.)	Col de Bousson (9760 ft.)	Col de la Traversette (6600 ft.)	Col de Larche (Argentière)
1. Large enough for 30,000 men and 5,000 horses to camp on its French side	4	5	3	5	5	5	5	0	5
2. Commanding a panoramic view of Po Valley	0	0	0	5	0	0	0	5	0
3. With a difficult descent on the Italian side	3	3	3	5	4	5	0	5	3
4. High enough to protect sheltered drifts of snow until the following winter	1	0	1	4	0	0	1	3	0
5. With pasture for horses after the difficult stretch of the descent	2	5	5	5	3	5	2	3	3
6. At distance of 3 days march from plains	0	3	3	3	5	5	5	5	5
7. Leading into the land of the Taurini	0	5	5	5	5	5	5	0	0
8. At one day's march from probable site of the 'bare rock' (or a day and a night for baggage and elephants).	5	3	5	5	5	0	5	2	3
Totals	15	24	25	37	27	25	23	23	19

This table is based on the table in Appendix II of J. M. Hoyte's *Trunk Road for Hannibal* and on Chapter 3 of M. A. de Lavis-Trafford's *Le Col Alpin Franchi par Hannibal*. Dr. Trafford considers the Col de Clapier and Savine-Cloche separately: we treat them together.

TABLE II: ELEPHANT PERFORMANCE—BRITISH ALPINE HANNIBAL EXPEDITION, 1959

Expedition timetable and location of encampments

Hannibal's timetable; dated from the 'ascent towards the Alps'

	Date (July)	Camp of Departure	Change in Altitude (feet)	Miles	Type of Road	Time of Departure	Rest Time (hours)	Travel Time (hours)	Average Speed (m.p.h.)
1st day—through narrow gorge	20	Pontcharra	125	5.3	paved, grass sides	3.45 p.m.	$\frac{1}{3}$	$1\frac{2}{3}$	3.2
2nd day—attacking enemy town									
3rd day—replenishing and resting									
4th day—steady marching	21	La Rochette	400	16.0	paved	8.24 a.m.	3	5	3.2
5th day—steady marching	22	Aiguebelle	450	16.8	paved	8.30 a.m.	$2\frac{1}{2}$	5	3.4
6th day—steady marching	23	La Chambre	900	17.7	paved	8.00 a.m.	$3\frac{1}{2}$	$5\frac{1}{2}$	3.2
7th day—morning parley	24	St. Michel	680	10.2	unpaved, narrow track	2.20 p.m.	$1\frac{1}{4}$	4	2.6
8th day—march to 'bare rock'	25	La Pra	845	10.6	narrow, partly paved	8.30 a.m.	$2\frac{1}{4}$	$3\frac{1}{4}$	3.3
8th night—battle and night march from 'bare rock'	26	L'Esseillon	1,500	9.0	narrow, partly paved track	2.00 a.m.	$\frac{3}{4}$	$3\frac{1}{4}$	2.8
Detour	27	Le Planey	1,170 down	10.0	unpaved, rough track	4.00 p.m.	$\frac{1}{2}$	3	3.3
9th day—to the 'summit of the pass'	28	Termignon	2,300	13.6	rough track, very steep	8.40 a.m.	$\frac{1}{2}$	$4\frac{3}{4}$	2.9
	29	Lac du Mt. Cenis	4,900 down	15.0	paved road	10.20 a.m.	4	$3\frac{3}{4}$	4.0

SUMMARY

Sunday July 26. Jumbo covered 9 miles in $3\frac{1}{4}$ hours at an average speed of 2.8 m.p.h. During this, she took $2\frac{1}{4}$ hours to travel 5.9 miles from the river Arc below Bramans to Le Planey (5,430 ft. above sea level), a vertical ascent of 1,670 feet. On this stretch, her average speed was 2.6 m.p.h. and her climbing speed 742 feet vertically per hour.

Tuesday July 28. Jumbo covered 13.7 miles in $4\frac{1}{4}$ hours at an average speed of 2.9 m.p.h. Doing this, and including its level sections, she climbed from Termignon to the Mont Cenis summit (6,893 ft.), a vertical ascent of 2,300 feet, at an average climbing speed of 484 feet vertically per hour.

BIBLIOGRAPHY

- ¹ John Hoyte, *Trunk Road for Hannibal*. Geoffrey Bles, London, 1960.
- ² Cynthia Pilkington (Treasurer of the B.A.H.E. 1959), *Elephant over the Alps*. Macmillan & Co. Ltd., London, 1961.
- ³ Prof. F. W. Wallbank, 'Some Reflections on Hannibal's Pass', *Journal of Roman Studies*, Vol. XLVI, 1956, pp. 37-45.
- ⁴ A. H. McDonald, 'Hannibal's Passage of the Alps', *A.J.*, 61. 93-101.
- ⁵ Sir Gavin de Beer, *Alps and Elephants, Hannibal's March*. Geoffrey Bles, London, 1955.
- ⁶ M. Perrin, *Marche D'Annibal des Pyrénées au Po*. Paris, 1887.
- ⁷ Paul Azan, *Annibal dans les Alpes*. Paris, 1902.
- ⁸ J. Colin, *Annibal en Gaule*. Paris, 1904.
- ⁹ Spenser Wilkinson, *Hannibal's March*. London, 1911.
- ¹⁰ H. Ferrand, *Simplex Réflexions sur le Passage d'Hannibal à travers les Alpes*. Gap: Jean & Peyrot, 1925.
- ¹¹ M. A. de Lavis-Trafford, *Le Col Alpin Franchi Par Hannibal*. St. Jean-de-Maurienne, 1956.

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