

SIR HIRAM MAXIM'S "LIFT AND DRIFT" EXPERIMENTS.

Diagram No.	Test Piece.		Wind Velocity.	Results.		
	Width.	Inclination.		Lift.	Drift.	Ratio. Lift : Drift.
	ins.		m. p. h.	lbs.	lbs.	
1	0	90°	49	0	2	—
2	2	0°	49	0	5.16	—
3	2	0°	40	0	4.56	—
3	2.83	0°	49	0	5.47	—
4	2	0°	49	0	2.97	—
4	2	0°	40	0	2.8	—
5	9	0°	40	0	0.78	—
6	9	0°	40	0	1.22	—
7	9	0°	40	0	0.28	—
8	9	0°	40	0	0.42	—
9	9	0°	40	0	0.23	—
9	9	1 : 4½	41	4.45	0.47	9.5 : 1
10	9	0°	40	0	0.59	—
10	9	1 : 4½	41	2.54	0.76	3.3 : 1
11	12	0°	40	0	0.19	—
11	9	1 : 2¾	41	7.08	3.23	2.2 : 1
11	9	1 : 3 1/10	41	4.53	0.78	5.8 : 1
11	9	1 : 6 1/10	41	3.37	0.5	6.8 : 1
12	—	0°	—	—	—	—
13	12	0°	40	0	0	—
13	12	1 : 20	40	3.98	0.3	13.1 : 1
14	12	1 : 16	40	4.59	0.53	8.7 : 1
14	16	1 : 10	41	9.94	1.12	8.9 : 1
14	16	—	41	10.34	1.23	8.5 : 1
15	12	1 : 14	41	5.28	0.44	12 : 1
15	12	1 : 12	41	5.82	0.5	11.6 : 1
15	12	1 : 10	41	6.75	0.73	9.2 : 1
15	12	1 : 8	41	7.75	1.0	7.7 : 1
15	12	1 : 7	41	8.5	1.25	6.8 : 1
15	12	1 : 6	41	9.87	1.71	5.8 : 1
15	12	1 : 12	41	6.12	0.54	11.3 : 1
15	12	1 : 12	41	6.41	0.56	11.5 : 1
15	12	1 : 16	41	5.47	0.37	14.8 : 1
16	12	1 : 10	41	6.97	0.7	10 : 1
16	12	1 : 8	41	8.22	1.08	7.6 : 1
16	12	1 : 7	41	9.94	1.45	6.8 : 1
16	12	1 : 6	41	10.34	1.75	5.9 : 1
16	12	0°	41	2.09	0.21	10 : 1
16	12	-1 : 18	41	0	0	—
17	8	0°	40	1.56	0.08	19 : 1
17	8	1 : 20	40	3.62	0.21	15 : 1
17	8	1 : 16	40	4.09	0.26	16 : 1
17	8	1 : 16	47.33	5.0	0.33	15 : 1
17	8	1 : 14	40	4.5	0.33	14 : 1
17	8	1 : 12	40	5.0	0.43	12 : 1
17	8	1 : 10	40	5.75	0.60	9.6 : 1
17	8	1 : 8	40	6.75	0.86	7.9 : 1

No. 5. Bar having a kite-shaped cross-section. The bar is 9 ins. wide, the distances from each edge to the point of maximum thickness being 6 ins. and 3 ins., respectively.



No. 6. Same bar as No. 5, but set with the thin edge to the wind, in which position it offers much more resistance.



No. 7. Bar of similar proportions to No. 5, but having curved surfaces.



No. 8. Same bar as No. 7, but placed with the thin edge to the wind, in which position it offers far greater resistance.



No. 9. Bar having a bottle-shaped section of similar proportions to No. 7, than which it offers less resistance.



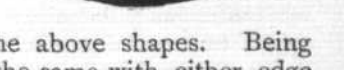
No. 10. Same bar as No. 9, but with the thin edge to the wind, in which position it offers greater resistance.



No. 11. Bar having a symmetrical elliptic cross-section with sharp edges. The bar is 12 ins. wide, and has less resistance than any of the above shapes. Being symmetrical, the resistance is the same with either edge facing the wind.



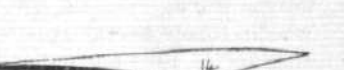
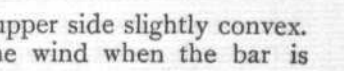
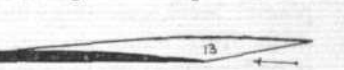
No. 12. Bar having a triangular cross-section, fairly deep in the centre and with a rounded top edge. With either of the thin edges facing the wind a decided lifting effect is produced.



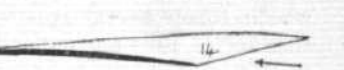
No. 13. Bar 12 ins. wide representing a flat aeroplane. The underside is flat, and the upper side slightly convex. No resistance is offered to the wind when the bar is horizontal.



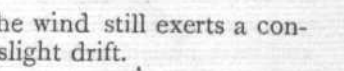
No. 14. Bar 16 ins. wide, representing a thin aeroplane. The underside is slightly concave. No. 15. Bar 12 ins. wide and slightly thicker than No. 14. No. 16. Bar of the same width as No. 15, but more cambered. When horizontal, the wind still exerts a considerable lifting effect and very slight drift.



No. 17. Bar only 8 ins. wide, which exerts a greater lift in proportion to the drift when horizontal in the wind than does No. 16, but is less advantageous when inclined.



NOTE.—All the above test pieces were tested in the same machine which produced a draught 3 ft. in width; the area upon which this wind played, however, varied with the width of the test pieces. The most effective aeroplane section—that illustrated in No. 17—was 8 ins. wide, the area in this case being 2 sq. ft. The lift produced by this section at an inclination of 1 in 16 was about 2 lbs. per sq. ft.



SIR HIRAM MAXIM'S EXPERIMENTS. Table of Results. The diagram numbers refer to the illustrations. All test pieces were 3 ft. in effective length, that is to say, they were subjected to a draught 3 ft. wide. The inclination is the slope of the plane to the horizontal wind, the front edge being raised except in the case of negative inclination. Figures are not available for No. 12, but the lift was positive with zero inclination. The results are expressed in total lbs. lift and drift for the full 3 ft. of each test piece, having a width as stated in the table. The width is the distance from front edge to rear edge, measured through the section.

DESCRIPTION OF TEST PIECES.

No. 1. Plain board, 6 ins. square, placed vertically in the wind.

No. 3. Same bar as No. 2, set edge on to the wind.

No. 2. Bar of square section (2-inch edge) set so that the wind blows directly on to one face.

No. 4. Round bar having a cross-sectional diameter of 2 ins.