



NEWS OF THE P.A.T.C. MOUNTAINEERING COMMITTEE

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FOUNDED BY
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COMING EVENTS:

Ray Moore's - Jan. 28, 1954, kodachromes by John Christian of his European trip, followed by (or preceding) the annual election of Mountaineering Committee officers. Directions to Ray's and voting qualifications are given in the previous issue of Up Rope.

Another Corbin Cabin trip coming up - this one to be headed by Fred Blackburn, and will be over the week-end of the 30th and 31st of January. The climbers have been rather conspicuous by their absence on these trips, so how about making it a point to be on this one. Let Johnnie Reed know (Woodley 6-4268).

It's getting rather late now, but there's probably still time for non-members to qualify if they want to vote in the coming elections. Anyone interested in joining the Trail Club and/or Mountaineering Committee contact Johnnie and he will start the wheel turning.

Those who missed the first showing of Arnold Texler's Kodachromes of the Coast Range, B.C., now have a second chance to see them. The National Bureau of Standards Camera Club is having an open meeting Thursday, Feb. 4 at 8:00 PM at which Arnold will be the principal speaker. The meeting will be in the MTL Building Lecture Room (1st floor, west wing). The main entrance to MTL, at the corner of Reno Rd. and Van Ness St. will be closed, and visitors must enter at the rear via the west Guardhouse, which is just east of MTL.

KNOTS FOR NYLON SLINGS

A Mountaineering Note in APPALACHIA, XIX, 598, 15 December 1953, Knots in Nylon Line - R. W. Hart, is of considerable interest to all climbers. It was induced by a rappelling accident on the Grant Teton last July in which a knotted nylon sling was used. While the description is a bit vague some sort of braided line was evidently tied in a square knot with the ends further secured by a half-hitch. The rappeller fell some 35-40 feet due to failure of the sling, knot, or of the belay point. The questionable sling could not be identified after the accident, however Hart hints that the sling came untied.

Tests in the referenced article indicated that a square knot with ends secured by half-hitches slipped under increasing load in a static testing machine at about 150 lbs. and broke at the knot at about 500 lbs. Conclusions based upon this evidence and discussions with Boston Navy Yard rope experts were: (a) use manila or flax if desire to make slings with knots; (b) if nylon is preferred, use at least $\frac{1}{4}$ " diameter line, use only splices and back-splice the ends; (c) braided nylon should not be used.

In practice, custom-made slings are very convenient because belay points can be of any size. Such slings require knotting. The strength, with light weight and abrasion resistance, of nylon is also advantageous. Braided nylon is often less expensive than stranded nylon rope. It has been customary in our climbing circles to use either a fisherman's knot or two bowlines to make slings and I know of no failures of these knots in service either in nylon or manila. It seemed appropriate, however, to check the precedents upon which our success with slings had been based.

Three types of nylon line were used in our tests. Each type had been used many times in actual climbing. The first was $5/32$ " nylon parachute shroud line, so common since war surplus became available. The second was $\frac{1}{8}$ " diameter three-strand mountain nylon. The last was a flat $1\frac{1}{2}$ " braided nylon tubing of unknown genesis but evidently parachute findings, sold for the last year by Gerry Mountaineering, Ward, Colorado. The knots used to tie the slings were either the fisherman's knot or two bowlines. The free ends of the sling were tied around the sling with overhand knots for further security. As a matter of interest the square knot in $5/32$ " shroud line was tested qualitatively and corroborated the knot slippage experienced by Mr. Hart.

The slings were passed over $1\frac{1}{8}$ " diameter pins in the shackles of a 60,000 lb. tensile testing machine. Loads were applied at rates of about 300 lbs./min. to 3,000 lbs./min. depending on the ultimate strength of the sling. The loads were increased, on the average, for 2 minutes before failure. The ultimate load and remarks on the type of failure are indicated in the table below. In all but one case, failure occurred at the knot. The pins were free to rotate; the tension in each half of the sling then tended to equalize. The load on the knot at failure is just

half the ultimate load applied to the sling. The knots appeared to pull up and jam tightly without any of the line passing through the knot. The overhand knots for securing the free ends were not drawn up tight nor were they jammed against the main knot as the load increased.

ULTIMATE STRENGTH OF KNOTTED NYLON SLINGS

I 5/32" Nylon Braid - 2 Bowlines (Sling Length 6-7")

<u>No.</u>	<u>Ultimate Load</u>	<u>Remarks</u>
1	836 lbs.	Failure at knot in all cases
2	828	Load applied at 300 lbs./min.
3	822	" " " " " "
4	814	Load applied at 600 lbs./min.
5	822	Load applied at 300 lbs./min.

II 5/32" Nylon Braid - Fisherman's Knot (Sling Length 6-7")

1	780 lbs.	Failure at knot in all cases
2	754	Load applied at 300 lbs./min.
3	750	" " " " " "
4	756	" " " " " "
5	766	" " " " " "

III 1/4" Mountain Nylon - Two Bowlines (Sling Length 6-8")

1	2184 lbs.	Failure at knot in all cases
2	2332	
3	2200	
4	2014	Knot either tightened or yielded and load dropped momentarily
5	1980	

IV 1/4" Mountain Nylon - Fisherman's Knot (Sling Length 6-8")

1	2074 lbs.	Failure at knot in all cases
2	1846	At various loads starting at about 800 lbs. the knots
3	1976	yielded. No. 2 and 3, two strands broke at ultimate load, third strand broke when load returned to 1020 lbs.

V 1" Nylon Braided Tubing - Two Bowlines (Sling Length 9 1/2")

1	4600 lbs.	Knot failure in all cases
2	4510	Starting at 3500-4400 lbs., knots yielded
3	3710	

VI 1" Nylon Braided Tubing - Fisherman's Knot

<u>No.</u>	<u>Ultimate Load</u>	<u>Remarks</u>
1	3680 lbs.	Failure at shackle 6" sling
2	4320	Failure at knot 7" sling
3	4310	Failure at knot 7½" sling
4	4470	Failure at knot 12½" sling
		Knots 2, 3 and 4 yielded slightly, starting at 2500 lbs.

CONCLUSIONS: Custom-made nylon slings for rappelling or as anchors for 5th Class climbing can be joined with either two bowlines or a fisherman's knot. Although small samples were used, it appears that two bowlines are slightly superior for connecting the two ends of the line to form the sling. Neither of these knots untie under static loading.

Art Lembeck, Bob Stinton
China Lake, California
January 5, 1954

NOTE: In the future it is planned to consider other aspects of climbing knots including certain additional opinions expressed in the original APPALACHIA articles. (A.L.)

HEARD BY THE EDITOR:

This skiing business is really taking its toll of the rock climbers these days. Latest converts are Bill Youden and Shirley (Twinkle-Toes) Jackson. The latter, we hear, is in Canada for the week.

Finally heard some news about Walt Kare (not from the horse's mouth). Seems he got himself hitched sometime last August. Quite a gal, we hear, - combines skiing, rock climbing and physicking all in one package. News was second-hand so we lack other details.

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Up-Beat

SONGS OF THE P.A.T.C. MOUNTAINEERING COMMITTEE

ETERNITY WHERE

By Jan Conn

Tune: My Home's in Montana

As I climb up the boulder with the rope
o'er my shoulder,
I've too much endurance and not enough skill.
I hang onto ledges with rough rocky edges
With never a quiver and seldom a spill.

With nothing to crawl on and too much
to fall on
I wish that my Mother had taught me a prayer.
As I slip from the nubble I know I'm in trouble
And think of that warning, eternity where?

THE BLOTTER SONG

By Jan Conn

Tune: Dark Town Strutters Ball

I'll be down to get you with a blotter, honey,
A nut-pick and a spare canteen,
'Cause where you're trying to lead
There ain't a foothold, handhold to be seen.
That old "thank God" is high above
And I don't want to follow when you make the lunge.
Though it's not the thing to do,
I'm going to cut that rope in two,
And I'll meet you at the bottom with a sponge.