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Natural History Notes on the Po Tsangpo and Rong Chu Confluence, Linzhi Prefecture, SE Tibet

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The Po Tsangpo gorge just south of the confluence

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The Po Tsangpo River of Southeastern Tibet flows primarily from east to west to drain part of the snow-covered Kangri Garpo[1] uplift, a mountain region northeast of the Himalayas that features many peaks rising to over 6000m/19685' and one that tops out at 6956m/22820'. At the Po Tsangpo's extreme western end, the river is joined by the Yigong [Yigrong] Chu and then turns south to pick up, at c.1980m/6500ft, the Rong Chu [recent Chinese spelling is Dongjiu] that drains the Lulang region and terrain west of the Po. In Tibetan, *tsangpo* means big river while *chu* is used for small rivers or streams. About 20km/11mi in a direct line downstream from the Rong-Po confluence, the Po merges, at ~1584m/5200ft and just northeast of Namcha Barwa, with the main Yarlung Tsangpo and from here the combined waters flow south, cross into India, and contribute considerably to levels in the Brahmaputra River of Assam.

Warm temperate forest and the Po Tsangpo just above the confluence with the Rong Chu.

I had the privilege of visiting the confluence of the Po and the Rong in June 1994 and again in June 1996. However I was not in the area on 10 June 2000 when a catastrophic flood raced down the Yigong to destroy a substantial bridge across the latter before roaring into the Po Tsangpo channel. This flood pushed water in some places to a height of at least 30m/98ft above normal levels and wiped out virtually all bridges between the Yigong Lake and the plains of Assam. On 08 May 2006, almost six years after the great flood, we again stood at the Po-Rong confluence.

When coming from Lhasa, one can reach the confluence by car on the well constructed Lhasa-Sichuan highway that descends along the Rong's left bank before turning into the Po Tsangpo Valley. It is possible to stop just short of the juncture, cross the Rong on a footbridge, and by using a village trail on the river's right bank, hike down to the confluence. In earlier years travelers did not cross the Rong but used a long, rope bridge that swung over the Po at a point about one kilometer north of the confluence. Kingdon Ward, coming from the south, passed through here on 23 December 1924 and recorded that "Pushing on … [we] … soon reached the Rong Chu junction, and half a mile farther on, a rope bridge over the Po Tsangpo." He noted the altitude of the riverbed at the rope bridge was 6,474 feet [see Ward, page 257].

On our visit in 1996 we crossed the footbridge over the Rong and walked down to the confluence. In 2006, we again followed the same track and found that in the ten years between visits, the Rong valley had changed little except for an overall increase in the density of the vegetation. In contrast, though, the Po Tsangpo Valley had been massively transformed.

A Saxifraga-like flower growing from the cliff face.

Just beyond the bridge across the Rong, the footpath skirted below an exposed cliff and on this face we noted a small, white-flowered plant clinging to the rocks. Judging from habitat, the floral arrangement, and that the stems and scalloped, rounded leaves were lightly covered in short hairs, this species appeared to be an unusual *Saxifraga*. The remarkable feature of this particular flower was that one [rarely two] of the five white petals extended much beyond the others [see illustration]. Above these white blooms, sterile fronds of the Soft Dryad (*Drynaria)* clung to the cliff and other ferns including *Asplenium* and *Polypodium* also flourished. In addition, a rhododendron, likely *R. nuttallii*, with much "wrinkled" leaves and large flowers, the white petals changing to yellow or orange towards the throats**,** hung over the top edge of the cliff. Rhododendrons are relatively uncommon at c.1980m/6500ft elevations and while this is rather conspicuous species, we missed recording it in 1996 as it had likely finished blooming by our June visit.

Beyond the cliff, the path passed across small gullies, each with little outwash fans now overgrown by a fine variety of plants. A distinctive species here was a large, handsome *Urtica or Girardinia* nettle with long stinging hairs. Another nettle, of more "normal" size, and with smaller, narrower leaves also grew nearby. False Nettles, *Pliea*, flourished in damp tracts while on slightly raised, pebbly patches with comparatively well drained soil, plumes of a grass rose to a height of 2.44m/8ft. These flowering stalks resembled the South American Pampas Grass (*Cortaderia*) or an *Imperata,* "elephant" grass, of the Asian lowlands. Other common species along the trail were a *Selagenella*, a blue *Corydalis*, a common sage (*Artemisia)*, the Orange Raspberry (*Rubus ellipticus)*, a *Zanthoxylum* with most impressive spines, and a *Viburnum* with pink flowers. The primary tree along the trail, growing on slight

rises between gullies, was the Himalayan Alder (*Alnus nipalensis)*.

The local footpath on the left with a profusion of nettles on the right.

In the 200 meters between the bridge and the confluence the bird life noted in 2006 were species typical of mixed, river-side habitat and these included the Green-backed Tits (*Parus monticolus*), Rufous-fronted Babblers (*Stachyris ruficeps*), and Whiskered Yuhinas (*Yuhina flavicollis*). A Blue Whistling Thrush (*Myophonus caeruleus*) perched on a streamside boulder. The most conspicuous bird sounds, the voices carrying above the cascading water of the Rong, were of Golden-spectacled Warblers (*Seicercus burkii)*, Golden-headed Ground Warblers (*Tesia castaneocoronata)*, and the distinct four-note calls of Large-billed Leaf Warblers (*Phylloscopus magnirostris*). There were no signs of the Lord Derby's Parakeet (*Psittacula derbiana*), an unusual species found only in SE Tibet and adjoining areas. In 1996 we saw a large flock of these birds flying over a mixed pine and hardwood forest further up the Rong valley.

One of several Whiskered Yuhinas, *Yuhina flavicollis,* in a flock in mixed brush along the trail.

After some 200 meters along the Rong, the track reaches the confluence, turns south into the Po Tsangpo channel and a kilometer later crosses to the east bank of the Po over a long, swinging bridge**.** Then the trail leads downstream towards the Yarlung Tsangpo and to villages on terraced spurs high above the valley floor.

At the confluence, the difference between 1996 and 2006 was stunning. In 1996, the track turned into the Po Tsangpo Valley and proceeded over a fine, nearly level terrace that was choked with numerous tangles of raspberries and other bushes and was well shaded with alders, black birches, and poplars, among others. Yellow-throated Fulvettas (*Alcippe cinerea*) and Chestnut-headed Ground Warblers haunted dense bushes near the ground while birds in the trees included Beautiful Sibias (*Heterophasia pulchella*) and Ashy Drongos (*Dicrurus lecophaeus*). Also, in 1996, we twice noted rather thin, brown snakes moving quickly across the path. In addition, Himalayan Rock Lizards (*Agama himalayana sacra)* with white-banded backs, sun bathed on exposed rocks near the swinging bridge.

The metamorphic gneissic cliff face exposed by the flood. Derek Martin, on the bottom left, stands to 1.83m/6'.

The flood of 2000 scoured the entire Po Tsangpo Valley floor back to the bedrock of the enclosing cliffs. At the confluence the now totally exposed walls, mostly of metamorphic gneissic rocks, clearly showed formerly horizontal layers pushed into near vertical stances.

"Our" terrace with its trees, bushes, birds and snakes was gone, completely washed

away. Instead of leading over a shady terrace, the 2006 track,

weaving past boulders, dropped steeply to a gravely stretch, and then on to sandy flats only some 3m/10 feet above the flowing water. In May 2006, this valley-floor was not much re-colonized by plants, likely due to recurring high water flooding. However, a few small alders and a *Coriaria nipalensis*, in red fruit, had taken root. The *Coriaria* surprised me. The plant is most often noticed along roadsides in highly disturbed conditions but the idea that it might be a colonizing species, in the manner of an alder, had not occurred to me

***Coriaria nipalensis* growing among pebbles on the valley floor**

Except where bare rock had been exposed, much of the terrain above the recurring flood level was now colonized on both sides of the river by alders, some over 3m/10ft tall, and other plants. It is likely that studies of regeneration and re-growth are being conducted at places along the length of the Yigung-Po Tsangpo-Yarlung Tsangpo-Siang watercourse and we look forward to seeing reports in due course.

The confluence lies at the lower edge of the warm temperate biome near the upper subtropics. The Yellow-throated Fulvetta, for example, is primarily a subtropical species while the rhododendron growing nearby is warm temperate. In addition, a few scattered pines (*Pinus*) growing near the confluence indicated that this area is in a moisture transition zone, sandwiched between very wet tracts to the south and drier, rain shadow areas to the north.

A rhododendron, likely *R. nuttallii*, at c.1980m/6500ft.

A flood of the 2000 magnitude is a result, partly, of heavy precipitation in an a mountain region with steep, fragile slopes. The initial massive slide that dammed the Yigung, for example, was a natural occurrence, the slip originating high on a densely forested hillside that saw little or no human activity**.** Interestingly, an even more severe flood occurred in this same area in 1901 and the high water mark was measured, in 1913, as 42.7m/140ft above normal [see F. Bailey, page 109]. Over the years, lakes have formed in glacial systems or by landslide impoundment and when their dams burst, valleys below are scoured; almost all major, high-altitude Himalayan valleys show scars. In this day of improved satellite imagery, better understanding of the dangers involved, and with improved communication throughout the Himalayan region, damage caused by these floods can be partly mitigated and loss of human life reduced.

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Footnote[1] The mountain jumble that rises immediately northeast of the Great Himalayan and Trans-Himalayan ranges does not seem to have a widely recognized name. This uplift rests on the Eocene or Lhasa Block between approximately 93 to 98 degrees east longitude and 28 and 31 degrees north latitude. The northern and eastern edges of this high terrain drain into the Salween River [Nu Jiang] while waters from the southern sections flow into the Po Tsangpo and the Zayul rivers [the latter reaches Assam as the Lohit]. In the extreme southeast, streams fall into the upper Irrawaddy [Ayeryarwady] watershed.

In his excellent book on the geography and mountain history of SE Tibet, T. Nakamura divides this uplift into three parts: Nyainqentanglha West, Nyainqentanglha East, and Kangri Garpo. The latter is a spur that projects to the southeast while Nyainqentanglha West is reserved for the rather isolated mini-range NW of Lhasa that features Nyangchen Thanglha Feng, a peak that rises to 7162m/23497.

As Nyainqentanglha West appears to be a distinct unit with a shear zone running along its southeastern edge that separates it from the Yangbaijan Valley [see Pan and Kidd, p. 775], and peaks farther east, it might well be useful to call this uplift the Nyangchen [Nyainqen] Range. In addition, there appears to be little geological distinction between Nyainqentanglha East and the Kangri Karpo spur, so it seems useful to drop the truly cumbersome name of Nyainqentanglha East and expand the coverage of Kangri Karpo to include the uplift between approximately 93 to 98 degrees east longitude and 28 and 31 degrees north latitude.

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