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Baby, It's Cold Outside!: *Lessons from making audio-recordings of wildlife* *in urban/semirural environments*

by Paul G. Ratcliff

Abstract

This article considers the adaptations required by the time-restricted wildlife sound recordist, who only has access to semirural environments, to achieve recordings. More than 200 experimental recordings and reflections have been made, advice pages reviewed, experts questioned, texts scrutinised and specialist talks attended to inform this articles' findings. The overall lessons learned will be of use to those who only have easy access to semi-rural environments and would wish to include nature sounds in their compositions that are either symbolic of a piece or characteristic of an environment. The article starts by comparing the differences in recording approaches used between a studio practitioner and the wildlife field recordist and latterly considers the tacit knowledge and skills employed by these wildlife-recording practitioners and the field-craft considerations, which underpin the successful projects. Subsequently it focuses on the barriers to recording in semi-rural environments and how the tacit knowledge of the experts can best be exploited to tackle these difficult recording domains. It includes first person observational accounts to illuminate what it is like to be immersed in these variable recording environments. It concludes by forming recommendations, which are based on tested approaches, that have yielded some success in these semi-rural environments. It is envisaged that the content and findings will be of use to those moving to record species and environment in the field, such as musicians, students studying soundscapes or composers exploring new environments.

Keywords: field recording, tacit knowledge, field-craft, wildlife, urban noise, sound editing

Introduction

Imagine being sent on your first wildlife-recording project and your producer compares the experience you are embarking on to recording an artist in a purpose-built sound recording studio:

The things you are going to record are often not visible, if they see you they will either hide, shut-up or move away quietly, that's if they were there in the first place. We are not always sure which area they might be in, which can be a bit of a problem, nor exactly what they will sound like and some imitate each other to add to the confusion! What's also strange is they will often only make noise at certain times of day and at a particular time of the year. Typically the place you will be recording will be near dark, often cold and wet, and take a long time to get to on foot. Don't forget to take all your equipment either, but pack wisely because you will be carrying all of it on your back. Oh did I tell you it could be dangerous too; it's not often artists will physically attack you, and if the animals being recorded don't, something else might. Normally, the quality of the recordings you might get will be affected by wind, rain, wave noises, river sounds, and traffic and aircraft noise. If you are lucky enough to actually make a recording you will be amazed how quiet their 'calls' can be, even if you can hear them reasonably well with your headphones off. Another thing is they rarely 'sing' directly into the microphone, except when you have wound the gain right up that is! And usually if all of the above happens to work out for you, someone will appear from nowhere and will start talking to you in the middle of your recording.

Although fictional the above does attempt to allude to some of the difficulties of recording wildlife; difficulties that are compounded, when recording wildlife in urban and semi-rural environments, by the sonic impact we have on our world.

Although the notion of tacit knowledge is explored in this article, it should not be assumed that these exponents were withheld intentionally. To the contrary, those choosing to embark on this branch of field-recording are positively encouraged by the professional and practiced amateurs of the Wildlife Sound Recording Society (WSRS) and through the information presented on their web pages and at their meetings.

Semirural, within this article is considered to be the countryside in close proximity to urban conurbations, and 'close' is defined as up to 4 kilometres. In some of the experiments, sounds were recorded in what most would class as the 'genuine' countryside so that a comparison could be established. Other occasions warranted experimentation in large urban parks, 5 km north of the city centre, but surrounded by busy roads or housing developments. Further recordings were made in suburban gardens. Within the article are first-person reflections cognisant of the immersive experience natural-history field-recording can be and included to illustrate the said practice.

Theory

Margochis's (1977) text, *Recording natural history sounds*, although seminal and still of use to the field-recordist venturing into natural history recording today, introduces many of the problems encoun-

tered and suggests some very practical solutions, which remain valid. Krause's (2002) in *Wild Soundscapes*, has a similar practical approach including exercises preparing the would-be practitioner. Yet both, despite their pragmatism talk little of modern DAW based editing or filtering, the purpose for which the recordings are intended, or to those recordists who cannot escape the sounds of human creations, and it is these latter issues which feature in this study.

Yet despite the aforementioned problems, anecdotally delivered in the introduction, there are recording specialists (recordists), both professional and amateur, to whom these are just some of the challenges and who overcome all of these challenges to make high quality recordings. Moreover some of these recordists almost revel in the challenge of recording rare species, to make the task in hand even more difficult.

Subsets of tacit knowledge have become apparent, knowledge that the practitioners have learned experientially or through sharing practice, which can be thought of in three interdependent categories (Field-craft, Recording, Context), with all being obligatory and none taking precedence. Yet participation and reflexion form the strongest theme of enquiry, and as the work progressed through the various projects the author developed skills, sometimes through experimenting and sometimes through informed creative practice, which have built upon read methods employed in the field.



Figure 1: The interdependency of the Field-craft, Contextual species knowledge and recording methods

To understand this interdependence further, consider the parameters impacting on the recording of badger *Meles meles* vocalisations. The recordist in the example does not have the time to make multiple visits to the site, so has to optimise their chance of a recording at the first visit to the location, and his strategy is mostly verified by Margochis' seminal text (1977, p. 18):

It's 10 p.m. on a warm June evening and I'm sitting on the edge of small disused and very overgrown quarry, in Warwickshire, listening to two separate monitoring signals from two recording configurations. The quarry sides are steep and my feet are resting on a branch, which is stopping me sliding down the banking. My companion and I have cut our way through brambles to form this perch. Currently briars are poking us and it's relatively uncomfortable even after a few minutes of sitting still... About 40 meters away from my position is the entrance to a badger den, and I am staring now into the shadowy area, looking desperately for any signs of badgers...the tell-tale white markings moving in the gloom, or if I'm lucky a call....I wait, monitor, listen and wait...

Firstly the recordist needs knowledge of the species and their habitat (the Text and the Context). Most would know that badgers are mostly (but not exclusively) nocturnal, and omnivorous; further enquiry suggests that they are dependent on their smell for navigation and for identification of others, and have like most mammals a

keen sense of hearing. Simplistically put; they come out to forage for earthworms at night and are shy creatures. They are also powerful animals, as evidenced by their self-dug tunnels and further reports suggest they can be dangerous when cornered. Finally they travel on known centred routes often to find water sources. Their vocalisations range widely ([/www.wildcru.org](http://www.wildcru.org), 2013) and indicate various types of communications from greetings to alarm calls. However, detailed reading, as with listening to first hand observations, will reveal more, such as during the height of summer they often appear before dusk and after dawn, breaking their perceived night-time curfew. Finally, entering forums online to seek advice needs to be treated carefully as the political divide caused by this creature attracts groups who might wish to extract location data from internet exchanges for criminal purposes.

Secondly consider the field craft considerations. In short this is the reading of the locations to optimise the recordings given the above species knowledge. To set up too close to the badger's set would be worthless as they would not emerge with humans present, meaning any human recordist typically needs to be a significant distance so as not to be smelled or heard. This leaves two options—remote microphone placement (parabolic dishes or hyper-cardioid directional microphones) or close microphone placement using either long leads or recorders left running close by. Most recordists would not wish the species to be harmed or their equipment to be damaged; if left near, it should be placed out of the “chewing zone.” Additionally wind considerations prove problematic, as the recordists need to be down wind to prevent being smelt yet this means the microphones will typically be pointed into the wind, causing potential overload of the microphones' capsules/diaphragms. Thus, a relatively windless, but not still, night is required. To add to the complications, wind, particularly near large water bodies, often changes in direction and strength near to sunset, thus a set up made during the day would not likely be appropriate for the time when the species might emerge. For those lucky-enough to witness a badger set they will be aware that mature locations can have many entrances to their sets, so with limited equipment the choice to place microphones aimed at the hole (set entrance) with the most recent disturbance seems logical. Finally, but not obvious to those new to wildlife recording, sounds made by the recordists, either voluntarily (e.g. talking, equipment adjustment noises) or involuntarily (e.g. breathing, foot falls, clothing rustle) need to be avoided.

Thirdly, the recording equipment primarily consists of battery operated mixers, microphones (powered by the mixer) and recorders. To optimise the chance of recording in stereo, omni-directional microphones are placed in a small tree suspended along with 50 metres of cables also in trees and plugged into a field recorder. Secondly a reflector dish and a directional microphone, both placed on the rim of the quarry where the badgers inhabit, are connected to a second recorder. All this needed to be set up before the expected arrival of the badgers in the viewing area/location of the recorders so that it is possible to observe activity without detection by the badgers. Early recordists would sometimes just press record and move away from the area; however in this case the directional nature of the parabolic dish and cardioid microphones might need adjusting and recording levels similarly monitored/adjusted if necessary. Unlike musicians in a studio these *unwilling performers* could be either very close or some distance away from the microphones, or face straight at or sideways on, causing very different signal levels. They can vary their voices' volume too to add to the complexity. Battery-operated radio microphone placement is normally ruled out as returning to a unit with failed batteries close to the species would warrant an additional invasion of their territory and possible further disturbance.¹

As the Figure 1 suggests, the creative process of placing microphones will depend on a combination of the species and its vocalisation, the control needed over the recording equipment and

the field craft of knowing how to interpret the placement of both the recordist and the microphones in relation to the species. Change one of these variables, such as the recording equipment available or the species, the field craft considerations need to be adjusted to offer up the best chance of recording.

Watson (2012) and Elliot (2013) would no doubt, suggest a different approach to the one outlined above, where recordists rushed by access limitations would attempt to optimise their chances by using several recording methods at once. Their approach would be to initially observe the environment to try to establish patterns of behaviour of the species, or at least obtain 'local' information prior to the investigation, so that this knowledge could inform both the equipment choice and placement. Whilst their approach has produced a catalogue of high quality recordings, the question arises how a recordist with less time available could optimise their chances at obtaining a reasonable recording? To address this, a more precise definition is required of 'acceptable recording' and what factors other than time and access are barriers to this recording.

Within the experiments that have informed this article, the recordist has used a combination of high-fidelity sound-recording equipment and simple budget hand-held recorders; yet it is the convenience and non-directional properties of the latter that have yielded equitable results in some instances. For example when recording Tawny owls *Strix aluco* calling that were not visible to the recordist, the omnidirectional microphone configuration of the hand-held recorder caught a more true representation of the birds-call than an off-axis directional expensive microphone and inline mixer,² although in this latter scenario the recorder was placed some distance from the recordist to avoid unnecessary recording of human sounds. However, higher fidelity omnidirectional equipment would be the best arrangement.

What makes a 'good' wildlife sound recording?

For most, a 'good' wildlife recording is one true to its source and has no unwanted additional sounds. The question of what is wanted or unwanted in a recording is not one that has straightforward answers. For example, Krause (2012) sees the whole biophone or habitat (all the species calling as in a soundscape) as a being the target for recording, and typically captures his soundscapes using mid-side configurations, yet others see a single species with their many variations in their vocalisations, as their focus (Elliot, 2013), and would use close microphone placement techniques. Most would concur that traffic or aircraft noise is an undesirable accompaniment to a species recording, yet even this depends on what the sound is actually for. For example a recordist capturing sounds for including in a game would avoid any 'background noise' and typically aim for single species recordings, yet a recordist demonstrating how a city-bound red fox adapts to its urban environment might even wish to include city noises including traffic.

Further qualitative judgements are made when considering the amount of editing of a piece. The Wildlife Sound Recording Society (WSRS) differentiates between those sounds which have been 'edited' and those which have 'not been edited or have minimal editing'; even this distinction is subjective as all recordings are subjected to having their microphones placed specifically and this placement is arguably a form of *editorialising*, albeit not in post-production. Normally, however, a good recording is where the species exhibit a clear true-to-life sound, where the sound is unusual (hence the search for rare species) or where the sound conveys some narrative, such as the mating calls of rival males. Like most recordings' dynamic range of spatial fields, depth perception is also considered with the preceding points.

Most listeners would be able to differentiate between subjects recorded with closely placed microphones and those recorded from



Figure 2: Recording red deer November 2012; just beyond, the busy road causes unwanted traffic noises

a distance, however for these listeners the former due to its presence and clarity will be preferable, despite the fact that most do not naturally listen to species at this proximity and this close proximity is to a great extent unnatural. Their preference will stem from their experiences of other recordings that will typically be closely placed microphones in studios or in other controlled environments. Thus recordings reviewed *out of the context in which they are intended*, can be inappropriately criticised due to their apparent lack of presence even though this might be a desirable aim of the recordist.

Barriers to recording in semirural environments

Contextual knowledge of most, but not all, species reveals that many vocalisations occur around dawn and dusk for birds and during mating seasons for mammals. Nevertheless this general principal can be easily challenged, for example kites, buzzards, and eagles all call readily during the daytime, as do many song birds. As the British seasons advance and daylight grows in spring and contracts in autumn, the first major hurdle to the semi-rural recording is that often these sunrise and sunset times co-exist with rush hour commutes. A distant car engine may not seem too much of a problem when recording particularly loud-featured sound, but unfortunately most of our native creatures have relatively quiet voices, unless recorded in very close proximity.³ For those new to wildlife sound recording the additional knowledge barrier about the subject or species should not be underestimated.

I park my car and put on my rucksack as the walkers return to their vehicles and take off theirs; it's dusk on a winter's evening and the ground is hard-packed snow. The path ahead loses what little light there is from the sky quickly as it and I disappear into the trees. The temperature and frost seem to penetrate the number of clothing layers I have on more as I progress, but by the time I emerge into the paddock and the last of the day's light illuminate the place where the deer could be, I have warmed slightly. I stop, unpack the field mixer, recorder, directional microphone, and headphones, put the equipment on and move into the grassy clearing, replace my gloves and listen. I check the connections and recording levels. Nothing at first, except the whoosh of car wheels on a road 2km from the location, so I walk on. The topography of the land forms natural acoustic barriers, but eventually after a further 10 minutes of walking some of these banks give way to reveal a view of grazing shadows about 200m away—these are the deer, with two large stags either end of the herd identifiable by the



Figure 3: Winter recording of Red Kites, March 2013, using the tree to disguise the recordist and standing on insulating mat to protect the recordist from the -5c degree ground

relative size and antlers. I pause and listen, watching the meters on the recorder as one of the stags' moans, more interested by his rival and females nearby, than me. The stag is quiet for a further five minutes, then calls again; the meters registering his groan against the -25db of the road noise, probably peaking at -15db; to the recorder hardly a difference, yet to my ears a clear distinguishable moan. I've been still on the frozen ground for about 20 minutes and I decide to walk on to another location as the herd is gradually moving away from my position. In my second location I capture two more calls, seconds of recording, for what is now two hours of one session, then it goes quiet and I wait....nothing. Eventually it's time to leave, I leave the recording apparatus on standby until I reach the wooded path leading back to the car. Two more moans and snorts! I turn quickly and start recording.....a loan stag is now only 50m away with his back to me, muffling the sound. I will him to turn, his outline is just visible as all of the light has nearly gone...he does turn, but does not call, once more I wait....10 minutes more....nothing. I fumble for my head torch with frozen fingers and walk the mile back though the wood only illumined by a small beam of light and reflected light from the snow on the ground. The roar of the roads grows uncomfortably loud as I approach the car, emerging from audible subtleties of the world of the deer.

Location studies will reveal naturally-occurring acoustic barriers where, given particular wind directions and the willingness of the subject to call, a reasonable recording can be made, especially with microphones that exhibit directional properties and are pointing away from the traffic noise. Additionally these barriers can both hide the recordist from species and also, for example, act as a shield from the noise created by a river when a song post is above the river, allowing the microphone to record bird calls with less river noise (Tombs, 1980).

Those familiar with the editing capabilities of some digital audio workstations (DAWs) might simply suggest post-production filtering solutions to remove the invasive traffic noises, and to some extent these methods do need to be exploited by the recordist operating in these environments, yet the results often leave "thin" sounds, with many sub-harmonics of the desired sound being removed with the unwanted noise, when compared to the dynamically rich offerings of the professional who often records in more remote locations.

In experiments when recording over 2km from roads and at quiet times for traffic, another man-made intrusion that becomes surpris-

ingly invasive into the world of recording wildlife is aircraft noise. Within a 10km range of an airport, the problem becomes particularly difficult to surmount and a constant menace. What makes recording these sounds in the field even more problematic is that most people subconsciously filter out air-traffic noise, a skill of which the microphone is rarely capable. Like traffic noise, the noise of the aircraft cuts across the frequency spectrum making it also difficult to remove through filtering in a DAW. The author when once asked by a student what is the best position for actually recording aircraft taking off and landing, given that they were unlikely to get access to the airports for safety reasons, did resist the retort of suggesting that all the student had to do was to sit in a wood and try to record a bird song. Knowledge of the flight-times can also be advantageous, although this knowledge in itself will not allay the frustrations of the semi-urban recordists in some locations where frequency of flights will be too intrusive.

Elemental Considerations

With wind, rain, cold, tidal rushes, running water all acting as deterrents to productive expeditions, these elements do not only impact the actual sound recorded, but also the recordist doing the recordings. The semi-rural recordist, like their professional counterparts, will need to overcome these natural barriers.

Warm protective clothing not only keeps the recordist comfortable, but will also impact on the ability of the recordist to stay longer in the field and increase the chance of recording a species. Most reading this and who engage in outdoor activities will be familiar with clothing layering methods and other clothing technologies designed to keep them comfortable whilst outdoors, however most of these 'systems' are designed for active people, people on the move, whereas by definition the recordist needs to be inactive. To counteract these difficulties a useful, light and versatile piece of equipment that should live in the recordist's bag is a closed-cell foam mat, which can be stood on or sat on, thus prolonging the time spent in the field and increasing the chance of recording. Once again when asked, most recordists used these artefacts, yet few actively bestow its essential nature, 'assuming' all know of it. If the recordist needs to be in the environment where the species vocalise they will need to be still for 15 to 20 minutes before the environment becomes use to, or tolerant, of their presence, and ideally wearing discrete clothing and maybe even camouflaging their human outline, using hides manmade or natural, which can include bushes, trees, and rocks, but can also be umbrellas, walls or motor vehicles.

Some of the environmental factors which impact equally on our semi-rural recordists and our experts alike are insects such as midges and mosquitoes, which if not protected against can cause most to abandon their post. As experiential learning remains a recurring theme throughout this study it's interesting to note few need reminding after their first abandoned session to protect against biting insects.

*It's a warm June evening, almost 16 degrees Celsius even though the sun has just dropped below the horizon and as I enter the wood the increase in humidity becomes apparent and the midges (small biting insects) are more noticeable despite earlier applying liberal amounts of insect repellent. The path weaves along the lakeshore to a clearing. With no previous knowledge of the area and unsure of what to expect in this ancient oak forest I locate a suitable branch on which to place the 'sit-mat' and listen. Secure that my equipment would be safe, I move into the clearing and place the hand-held recorder on a rock about 30m from my original position and midway between where I would sit and the other side of the clearing, having already pressed record and 'guessing' the appropriate recording level. I return to the log as the dampness of the location and the cold air funnelling off the lake causes the temperature to drop to single figures....quickly I put my coat on and listen and watch. A pair of common ducks fly across the clearing after about 10 minutes further waiting, then the usual singers of the wood start their evensong as the light dims further: blackbirds, robin, wren and a distant cock coo, now a rare sound in England. As their calls subside the midges intensify their attack on me and I retreat further into the warm coat. Then it's quiet, again....The stillness and lack for traffic noise, even in the distance, is hypnotic, I can hear my own shallow breathing. As darkness finally comes to the wood, a Tawny owl (*Strix aluco*) starts to call, but not its well know call, but instead a 'kewitt, kewitt' sound, followed by more silence, then from 3km away across the lake there is a classic call from another owl, its sound travelling across the still water into our forest clearing. Almost immediately the owl, perched somewhere on the other side of the clearing to me in the darkened branches, calls back in a similar manner...for a few seconds, then nothing. I wait for another 30 minutes before retrieving the recorder from the rock, hopeful to have captured the bird's sound. I return to the tent a few kilometres from the recording location, planning to return the next night with a more elaborate recording set-up... [It did call the next night but the undisclosed perch and large time lapses between calls made it hard to use the directional recording equipment.]*

Although the semi-rural recordist will endeavour to find locations a distance from human noise it does not always follow that humans will not be close. One project was nearly abruptly curtailed when two fast moving mountain-bikers only narrowly missed the recordist's 'hide'. Another occasion found the recordist being shelled by falling shotgun pellets being illegally fired across a bridleway (permissive path). A third when he came between two rutting stags whom had circled each other, and approached the recordist apparently silently during twilight. Like cities, it seems, rural and semi-rural environments are not without their hazards.

Further thought needs to be given in semi-rural locations to humans interfering with or stealing equipment, especially if used at a distance by the operator. (Most recordists operating in the mode are likely to have budgetary constraints as well time and access barriers and not wish their equipment tampered with or taken). Like recording in the true wilderness, semi-rural/urban recordists should look for signs of species; song-posts, droppings or footprints to help them locate the species.

Some recordists might focus on recording naturally occurring sounds which don't originate from species, such as wind, thunder, rain or waves or river noises for inclusion in games, films, radio productions or installations; and see these environmental sounds as their prime object, rather than factors to contend with, and it is in these cases that the species recordings might actually be seen as the intrusions to the environment.

With the developments in short-term local weather forecasting now available online, in one respect the time-restricted recordist has the information available to make a decision as whether to tackle an impromptu recording session, or to avoid what might turn out to be a wasted trip.

Conclusions

After reviewing over 200 recordings⁴ of varying length from minutes to hours and with most being in what could be described as semi-rural environments, listening and talking to the expert practitioners whom have extensive recording experience and have made many high-quality recordings, to what advice does this article offer and how does this advice differ (if at all) to those following the guidelines of the professionals practising in rural environments?

Firstly, if at all possible tackle the recording project following the recommendations of the professional recordist, which normally include, researching, observations, planning, and then recording species, setting your microphones close to, and keeping yourself at a distant from, the subject and record in human-free environments protecting your recordings, equipment and yourself from the environment, as well as restricting your impact on this environment.

However if faced with time pressures, transport limitations and only being able to access semi-rural locations, the following methods, often in addition to the above, have yielded some success:

Guerrilla tactics

1. Have your equipment ready (packed) and pre-checked: batteries, connectors, settings, configurations, formats; as you will need to optimise your time in the field and not miss opportunities due to equipment preparation time.
2. Always carry or have-to-hand simple, quick to set-up recording equipment, so that you can capture opportune recordings. Typically the recorder should be put down/hung or isolated using a simple tripod to avoid handling noise and other noises from the recordist.
3. Unlike longer recording projects where the chance at a second session might be reasonably expected, do some playback checks in the field, as often a second chance at a recording might not be available.
4. Know your area and environment by reviewing distance from roads, wind directions and popular times for aircraft; from simple internet searches so that you can best capitalise on the limited available time for a given location.
5. Although large amounts of time on a recording might not be possible, consider multiple short trips to a local environment, each time recording and each time learning about the species, their context and how to shield against unwanted sonic intrusions of the said environment. However total project times need to be considered especially if initial visits do not yield promising results and the only option is to plan trips of longer durations in more favourable environments.
6. Be prepared to spend appreciably more time editing these recordings than you might want and especially in comparison to those recording made in more favourable situations,

even though editing will not normally fully compensate for less-strong recordings.

7. Reference your recordings against those completed in more favourable conditions for although it's likely you will not achieve the quality, it still remains a desirable aim.
8. Consider full disclosure of the editing process used as well as the equipment specification, as like the professionals have found the recordings might be intended for one purpose but are used elsewhere.
9. Review the field-craft approaches of the recording process for a given species in a particular location, for your equipment limitations, to optimise your chance of success, recognising the interdependence of these variables. Also note that some species rarely inhabit the urban or semi-urban environments.
10. Alter your regular routine to take in walks that bring you through woodlands or parks, and stop and listen, as it is surprising what is active in semirural environments and what you might be able to record, but note you are seen as an intruder to the animals' environments so they might take some time to emerge or vocalise.

Experiential learning and learning from the practice of wildlife sound recording in the field, in keeping with Nelson's (2013) *Practice based Research* approach, underpinned the methodology of this work. However it is the unpredictability of these recording environments and the need to constantly review and consider the field-craft, environmental context and recording approaches as these habitats unveil their variability that makes these recording conditions constantly challenging to the recordist.

Notes

- 1 Battery life rarely matches manufacturers' claims especially when used in cool and/or damp conditions.
- 2 The budget equipment (£300, \$470 US) was approximately a tenth of the price of the more expensive configuration (£3,300, \$5000 US).
- 3 Most experts would take the time, if at all possible, to place microphones close to the species vocalising to ensure a strong signal.
- 4 In total over 500 separate recorded files were made, many quickly discarded and 200 reviewed, however the 'successful' yield from these is much less than 10%.

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