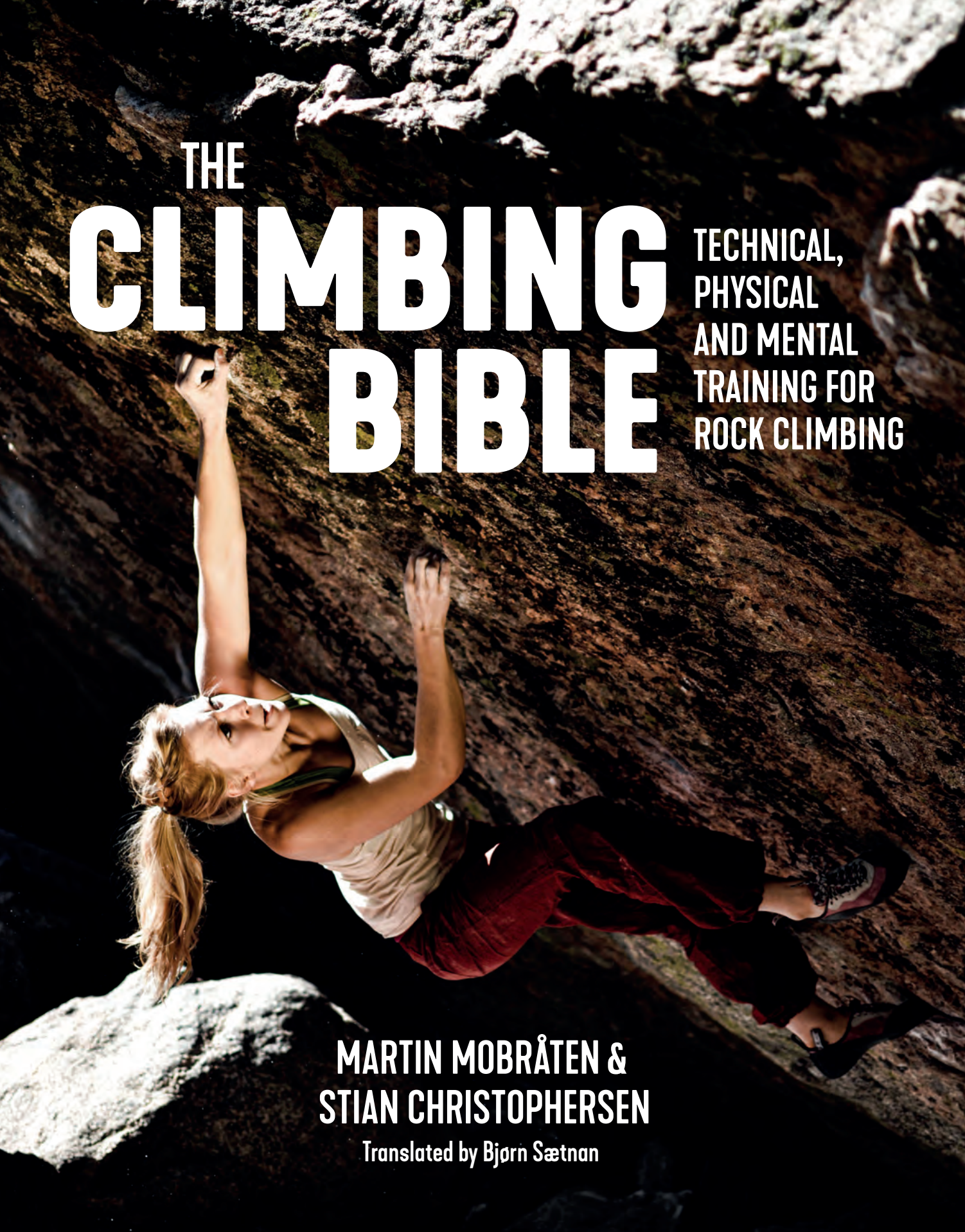
THE
CLIMBING
BIBLE
TECHNICAL, PHYSICAL AND MENTAL TRAINING FOR ROCK CLIMBING
MARTIN MOBRÅTEN &
STIAN CHRISTOPHERSEN
Translated by Bjørn Sætnan

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Vertebrate Publishing, Sheffield
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Stian Christophersen enjoys the view from Grande Grotta, Kalymnos, Greece.

PHOTO: CHRIS BURKARD

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MARTIN

Mum and Dad, thank you for allowing me to follow my passion!
Maria, it's just awesome that I get to share climbing and the rest of my life with you!

STIAN

Thank you, Dad, for all the amazing trips and for introducing me to what has shaped my life. Thank you, Karianne, for your patience and for always helping me when I'm stuck. Thank you, Mum, for always believing in me, no matter what.
Kasper and Oda, this one's for you.

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The lack of good holds for hands and feet emphasises the importance of good technique. Siri Olimb Myhre gliding up *Oppvarmingseggen* (Font 6c+), Harbak, Norway.

PHOTO: BJØRN HELGE RØNNING

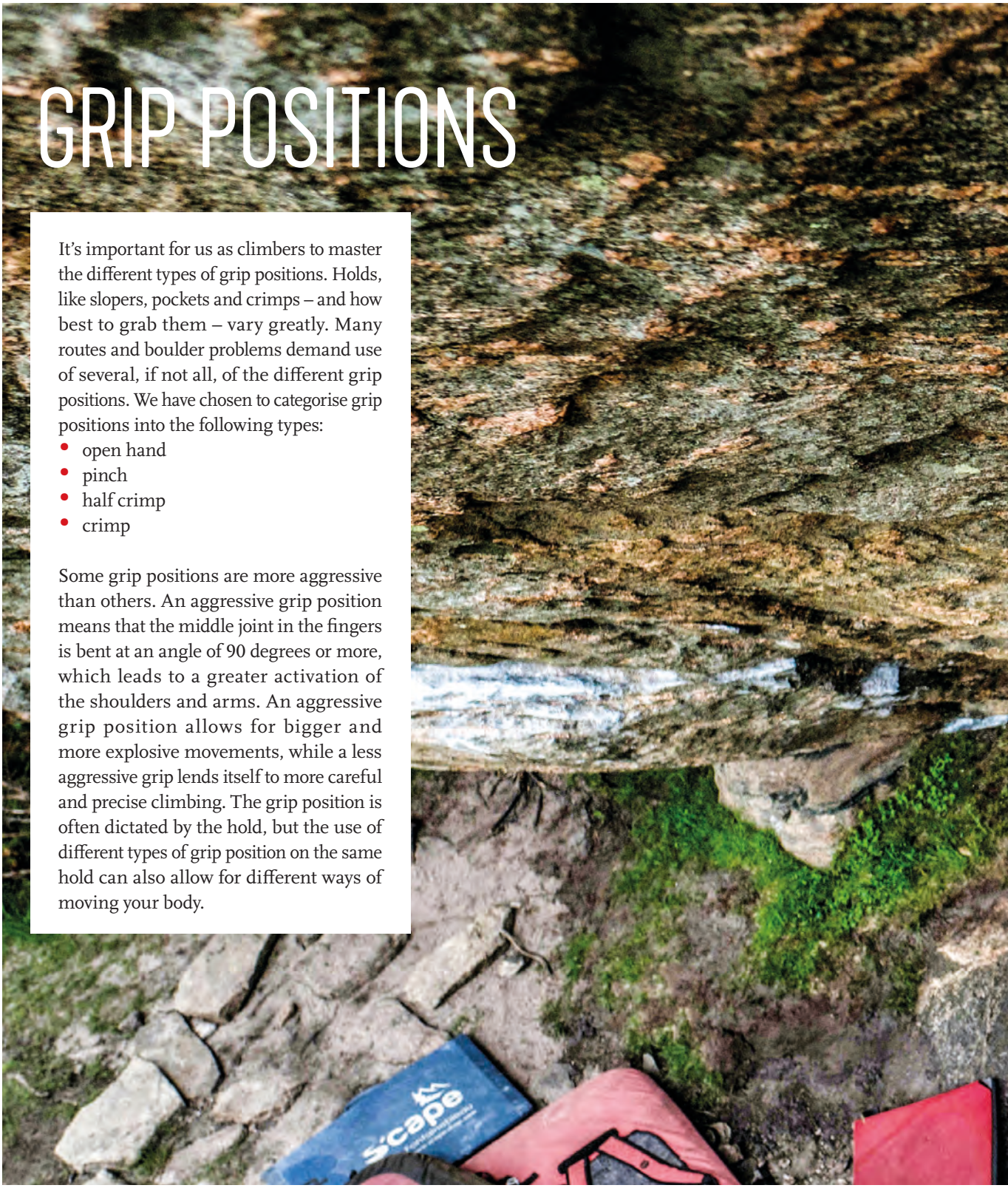
CHAPTER 1

TECHNIQUE

CLIMBING IS DEFINED as a technical strength sport. In other words, technique is one of the most important elements to master, but for many it will also be the most difficult. So, what is technique, and, perhaps more importantly, what is good technique? If you see a child who has never moved up a wall before, it will have an intuitive understanding of maintaining balance on the wall. This is an example of good technique. Similarly, we often see that beginner climbers who have a good physical foundation tend to rely on their arms to get up the wall. This is an example of poor technique. Technique therefore has to do with maintaining balance and conserving power. But is this all, and is there a universal answer to what is good technique? We want to argue that there are a number of basic movements and positions that are universal. At the same time, physical and mental abilities and limitations will allow for great variation in how the various techniques are used.

This chapter presents grip positions, footwork, foundations and specific techniques. We also look at which of these are suitable for different types of climbing. Finally, there are tips on how to train technique.

GRIP POSITIONS



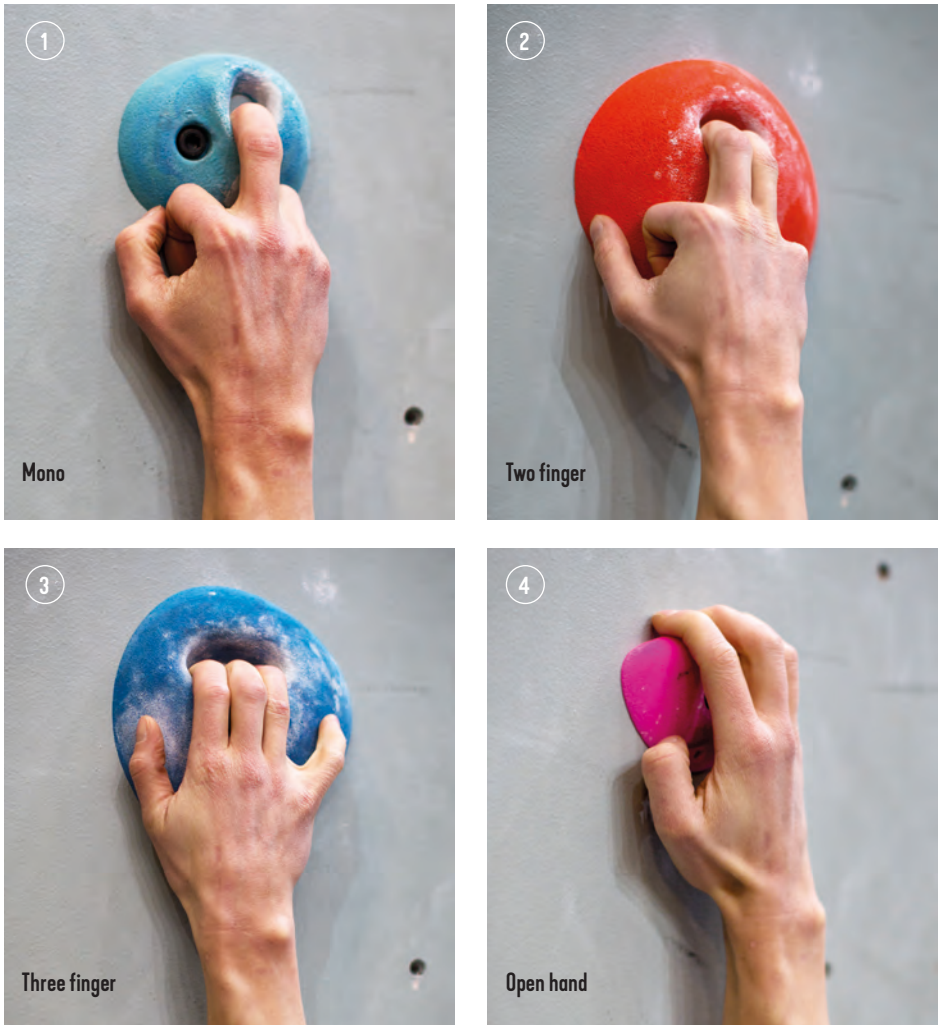
It's important for us as climbers to master the different types of grip positions. Holds, like slopers, pockets and crimps – and how best to grab them – vary greatly. Many routes and boulder problems demand use of several, if not all, of the different grip positions. We have chosen to categorise grip positions into the following types:

- open hand
- pinch
- half crimp
- crimp

Some grip positions are more aggressive than others. An aggressive grip position means that the middle joint in the fingers is bent at an angle of 90 degrees or more, which leads to a greater activation of the shoulders and arms. An aggressive grip position allows for bigger and more explosive movements, while a less aggressive grip lends itself to more careful and precise climbing. The grip position is often dictated by the hold, but the use of different types of grip position on the same hold can also allow for different ways of moving your body.

PHOTO: BJØRN HELGE RØNNING

Stian Christophersen om *Fokus* (Font 8a+), Harbak, Norway. Stian is crimping hard with his left hand while reaching for the crux pinch.



Holds 1–3 are what we call pockets.

OPEN HAND

This is the most common grip position and it can be used on most holds. Most of the flexion and load is focused on the outermost joint. Climbers can use one to four fingers in this position. The number of fingers engaged is usually based on the shape and size of the hold.

It's worth noting that once you add the pinkie finger to this grip position, you engage your arm and shoulders and the grip position becomes more aggressive. This is because when you engage the pinkie the angle of the middle joint on the other three fingers is reduced.

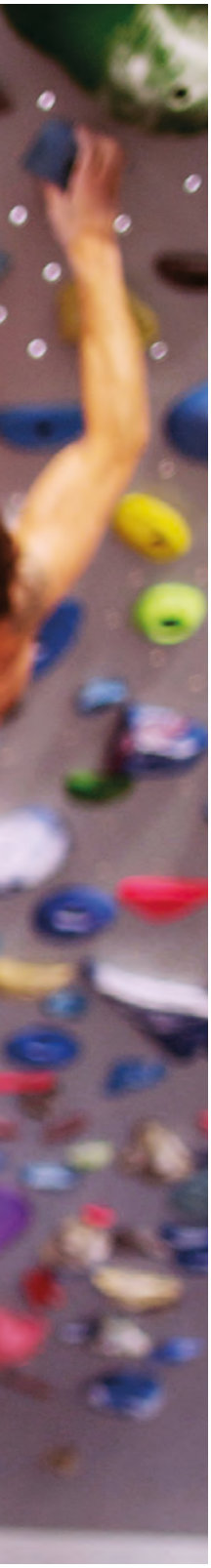
This photo shows the correct grip position on a sloper, providing a large contact area between the hold and the hand, and hence more friction.

This photo shows a half-crimp grip position on a sloper, which reduces the contact area and therefore the friction.

The open-hand grip position is especially handy for large holds and pockets, but can also be used for smaller edges as long they aren't too thin. Open hand grip is the preferred grip position for lead climbing as the physical cost is lower than with other types of grip position. It is assumed that the fingers are less prone to injuries when using an open-hand grip position instead of more aggressive grip positions.

When climbing on slopers, as in holds that have a negative angle, a variant of the open-hand grip position is usually used. The goal is to maximise the contact area between the hold and the hand and fingers. More contact area means more friction, as demonstrated in the photos above.


'LEARN TO DO BY KNOWING
AND TO KNOW BY DOING.'
JOHN DEWEY



TECHNIQUE TRAINING

In a way, we are all training our technique every time we go climbing. Every time we put on our climbing shoes and move around on the wall we're practising different techniques and constantly assessing whether to move dynamically or statically, and how to adjust our balance. But you should still set aside some sessions to focus specifically on certain techniques to ensure the quality of the training. Such sessions should follow these guidelines:

- You should be well rested, motivated and curious.
- You should define focus areas in advance.
- During the session, maintain focus:
  - *How should the move be executed?*
  - *How am I executing the move?*
  - *How can I improve the execution?*

The first point is perhaps the most simple. Yet we still see many climbers fall victim of the temptation to train hard and physical when they feel fit and rested. Technique can be trained on its own or as part of a climbing session, but it should never immediately follow a physically demanding session as you will be less focused. Technique training is about discovering new movement patterns and nuances of your already established techniques. You need to be fresh, motivated and curious to challenge the status quo, and be open to new ideas from your peers.

For technique training to be effective you should define one or more focus areas. These should be based on your weaknesses as a climber. Some climbers are well aware of their strengths and weaknesses, while others are not. Those of you who are unaware should seek help from either a close friend or an experienced coach who can point out areas you should focus on. It's important that the person giving you this feedback knows you as a climber and spends some climbing time with you. An experienced coach will, within a few hours of varied and challenging climbing, be able to point out your strengths and weaknesses. Most larger commercial climbing walls will have experienced coaches available to help you with such an evaluation. Alternatively, you can test yourself on different boulder problems and routes and see if you can spot a pattern and assess which types of problems or routes you find easy or hard.

One of the biggest challenges of identifying strengths and weaknesses is that it's often possible to climb a boulder or route in the style that suits you the most. For example, a static climber will often be able to do a move statically, even if this move should ideally be performed dynamically. Being made aware of this makes it possible for the climber to plan sessions where the focus is primarily on dynamic climbing. By starting a process where they continually challenge themselves in a structured manner, dynamic moves will over time become a part of their normal movement pattern. This way they're not only practising dynamic moves when specifically training them, but also when they're 'just' climbing.

When training specific moves and techniques, it's important to have a clear picture of how a move should be executed and how you're actually doing it. Try paying really close attention to how other climbers are doing it, especially those who are doing it correctly. To understand how you yourself are doing a move it's helpful to discuss with others and to film yourself climbing. Having an experienced climber or coach point out strengths and faults in your execution at the same time as watching a video of yourself climbing is a powerful tool in understanding and developing your technique. Remember, it takes a trained eye to spot the minute details of climbing techniques, and whoever you're discussing it with should be experienced in coaching climbers and know your strengths and weaknesses. At the same time you need to be open to new ideas and spend time in the ongoing process.

STAGES OF DEVELOPING TECHNIQUE

Learning a new technique takes time and effort. When describing the progression of learning a certain technique, it is common to look at technique training as a repetitive exercise where you go through different stages:

FAMILIARISATION

Here you get an overview of how the technique is performed. This usually starts with watching other climbers before trying it yourself. When you try to perform the technique yourself it can be a good idea to divide the technique into familiarisation exercises which contain elements of it. This will make it easier to combine all the different elements into one movement. Using deadpointing as an example, the familiarisation exercises could be:

- finding the starting position for the move
- deciding the direction of the movement
- defining the optimal position on the wall at the end of the move.

Becoming comfortable with these three elements will make it easier to start trying the whole movement and to enter the next stage.

COARSE COORDINATION

Here you practise the moves until you can consistently repeat them. At this stage it's reasonable to pick three to five boulder problems or challenging individual moves that require the chosen technique for this training session. Get help from a coach or an experienced climber who can define the moves, or find a suitable boulder problem at your local climbing wall. It's important to be conscious of what makes a move harder or easier, and to get feedback from others on your execution. Filming yourself climbing is an important tool at this stage.

FINE COORDINATION

Here you focus on the details of the movement. It's important to have a high number of repetitions and to really fine tune the moves until they are executed to perfection. At this stage the feedback you get from your own body is more important than what others tell you. This is because it's difficult for others to pinpoint the details that make something feel right or wrong for you individually. Filming yourself in slow motion can help give you an even better understanding.

AUTOMATION

At this stage your body should be on autopilot and you should be climbing without thinking about the move itself – as long as the conditions are similar. But just because a move is automatic doesn't necessarily mean it's also optimised. Most moves have some scope for variation, but only one way is the optimal way. This means that even though you have learned a new technique, it's important to stay curious in order to optimise it. Getting feedback from others, filming yourself and listening to your body when climbing are the most important ways to improve.

ADAPTATION

This is perhaps the biggest challenge for us as climbers. There will always be small differences between different wall angles, formations, and types and sizes of holds. Even if a certain technique is automatic on a particular boulder problem or route, you will still have to adapt it when you come across similar moves. Experienced climbers often look like they're climbing purely on intuition. This is a result of them mastering different techniques and not having to stop and think every time they're about to do a move. They recognise and initiate the moves automatically.

External factors also play a role. For example, it can be quite difficult to climb with perfect technique during a competition with lots of spectators, or when you're run out far above the last piece of gear or bolt on a route. External factors will always affect your climbing. You should be prepared for this and minimise the effect it has on your technical execution.

There are large differences in the complexity of different techniques. More complex techniques require a lot more coordination and demand higher precision. These techniques require many familiarisation exercises and much training before they can be mastered. They will also be difficult to reproduce in new situations. Some techniques might only be suited to one single move on one single boulder problem. Others can be useful just about all the time.

Beginners and intermediate climbers should therefore focus on the techniques they will need the most often – those regarding balance, and simple dynamic techniques.

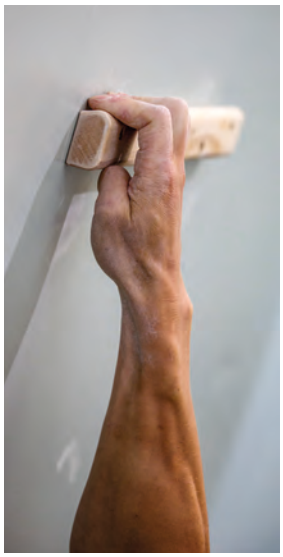
Remember that technique training is like anything else: practice makes perfect. If you want to become better at lead climbing on vertical walls, you need to practise the techniques needed for that style of climbing. If, on the other hand, you want to become a competition climber you should focus on coordination moves and dynamic climbing.

It's important to lower your shoulders and slightly rotate your elbows in towards each other.

Avoid hanging passively with your shoulders up by your ears, as shown in the picture above.

DEADHANGS

Finger strength has always been regarded as important, but it is only in recent years that specific finger strength training has gained any real traction in the climbing community in general. Spanish climber and researcher Eva López deserves much of the credit for the increase in knowledge on the subject of finger strength training. Her PhD on the subject brought forth simple and effective training methods by using deadhangs on fingerboards to improve finger strength. The advantage of deadhangs is that the load is easily adjusted based on the level of the climber, and progression is easily tracked. The load is adjusted by increasing/decreasing the size of the hold, by adding/subtracting weight and by adjusting the hang time.



The most useful grip position when training finger strength is the half crimp. Your front three fingers should be bent at 90 degrees at the middle joint, and all four fingers should be engaged on the hold.

If your hand opens, let go. This means the load is too high and you're at risk of injury.

1. SIZE OF THE HOLD

It will be progressively harder to hang a given time interval as the hold becomes shallower. Down to a certain point, around 2 to 4 millimetres, the depth of the hold can be a measure of how strong your fingers are. On shallower holds than this, the anatomy of your fingers and the friction will decide if you can hang or not, and reducing the hold size won't give an increase in muscular training effect.

2. TOTAL WEIGHT

If it's too hard for you to hang with the full weight of your body, you can start by subtracting from your body weight by using an elastic band or a rope pulley system with weights. Stronger, more experienced climbers might have to add extra weight, as they're already accustomed to hanging on small holds with the full load of their body weight.

3. HANG TIME

The smaller the hold you use or the more weight you add, the shorter the time you'll be able to hang on. A shorter hang time with more added weight or a smaller edge size will cause some specific adaptions in muscles, tendons and connective tissues, while longer hang times with less load and a bigger edge size will cause others. It's important to note that you will also have gains in strength with longer hang times as long as you hang on close to failure; strength gains do not only come from short and heavy hangs. To use hang time as a variable, it's easier to vary your training and train with different methods to meet the training goals you've set for yourself.

We recommend using primarily the half crimp grip position. This is the grip position that provides the highest muscular load to the forearms, and it is also of value for other grip positions. But it's important to remember that whatever grip position you're training is also the grip position you'll get strongest at. So, if you want to improve your pulling power on slopers or pockets, then the grip positions you are training should reflect this. It's also important to maintain control of your hang posture. You should pull your shoulders down and back, with your arms straight, and the inside of your elbows facing each other.

KEEP THIS IN MIND!

Deadhanging is specific strength training for your fingers, and the climbing community has traditionally regarded finger-specific training as putting climbers at an increased risk of injury. The recommendation is usually that you should have a certain training base before starting with this method. This base is built through general climbing, and you could also argue that it builds other performance factors rather than just pure finger strength. Working on all factors of your climbing is where your focus should be at the start of your climbing career.

Still, it's important to point out that deadhanging is by no means more stressful for the fingers than hard, fingery bouldering sessions, and well-controlled, specific strength training for the fingers could actually mitigate the risk of finger injuries in the future. It is much easier to regulate the load when doing deadhangs than during a bouldering session, and because strength training, in general, is regarded as one of the single most important factors for reducing the risk of injury across any sport, it's natural to assume that it's possible to achieve a similar effect with specific finger strength training.

Special care must be taken regarding finger-specific training for younger athletes. Because of skeletal development throughout childhood and adolescence, younger athletes may be more susceptible to skeletal injuries following high-intensity finger training methods on fingerboards, campus boards and on the bouldering wall.

DEADHANG TRAINING METHODS

Here are the three methods we recommend for deadhang finger strength training.

1. HANG ON

HANG TIME	REST	REPETITIONS	SETS	BUFFER	GRIP POSITION
30 seconds	3 minutes	1	8	None: hang on until failure*	Vary between half crimp, open hand, pinch and sloper

This is an easy starting point for many climbers. We're using hang time to failure to set the load, meaning that on the given hold you must be able to hold the grip for over 30 seconds. You can use bigger holds or even a pull-up bar, or take some weight off with a band or a pulley system, to enable you to hold on for the 30 seconds. If you can hang on for a substantially longer period of time (such as 40 seconds or more) you need to use smaller holds or add weight. We find this deadhang method relevant for training all the different grip positions except full crimp. We recommend that you vary between different grip positions during the session.

Start with one session per week and progress to two sessions per week after three to four weeks of training. As you go several times to failure, this session should be done as a standalone session in combination with complementary strength training.

*Failure also means technical failure. If you lose form in your hang posture or can't maintain your finger position, you've reached technical failure and should step off.

GENERAL STRENGTH TRAINING

Strength training is an important method for reducing the risk of injury, and it is estimated that for a number of sports this risk can be reduced by as much as a third if we perform strength training on a regular basis. For example, the risk of a knee ligament injury in handball has been shown to be halved with specific strength training, and the risk of shoulder injury in handball can be reduced by a third with a specific exercise programme carried out twice a week. We can assume that this also applies to climbing-related injuries, and here both the specific strength training, which we presented at the beginning of the book, and more general strength training are important.

In the chapter on physical training, we presented several specific strength training exercises for the upper body, arms and fingers, and we explained why these exercises can help to take your climbing to the next level. By regularly performing these exercises we can assume that the risk of injury is reduced because the muscles, tendons, ligaments and bones become stronger, and we gradually build the strength required to endure the increased training load. This, in turn, prevents unnecessary breaks in our training caused by injury, breaks which might lead to large fluctuations in the training load. There is no reason not to do strength training.

General strength is especially important for training opposite movement patterns to those we encounter in climbing. In climbing, and through specific strength exercises, we train what are called the 'prime movers' for climbing – that is, the musculature that grips and pulls us into and up the wall. Climbing is a sport with a varied movement pattern, but this is the essence of climbing. The more we climb and train for it, the stronger the prime movers naturally become. This increases the need to strengthen the muscles that make the opposite movements – the so-called antagonists. Essentially these are muscles that push us away, rotate our shoulders outwards and pull our shoulders backwards. Important in preventing injury is creating a balance between the muscles that pull us up and into the wall, and the muscles that do the opposite.

By combining general strength training with climbing-specific exercises, you will become better equipped physically to endure an increasing training load and create a balance between the prime movers and the antagonists. Here we present a selection of the general strength exercises we believe are most important for you as a climber.

Strength training doesn't need to be complicated or time-consuming, nor does it require fancy equipment. The most important thing is that you are aware of what exercises you should do and how to do them. We have divided the exercises into exercises which use only your own body weight (including exercises using a bungee), and more traditional strength training exercises with weights, slings and other exercise equipment.

Slopestyle (Font 8b), Rogaland, Norway.

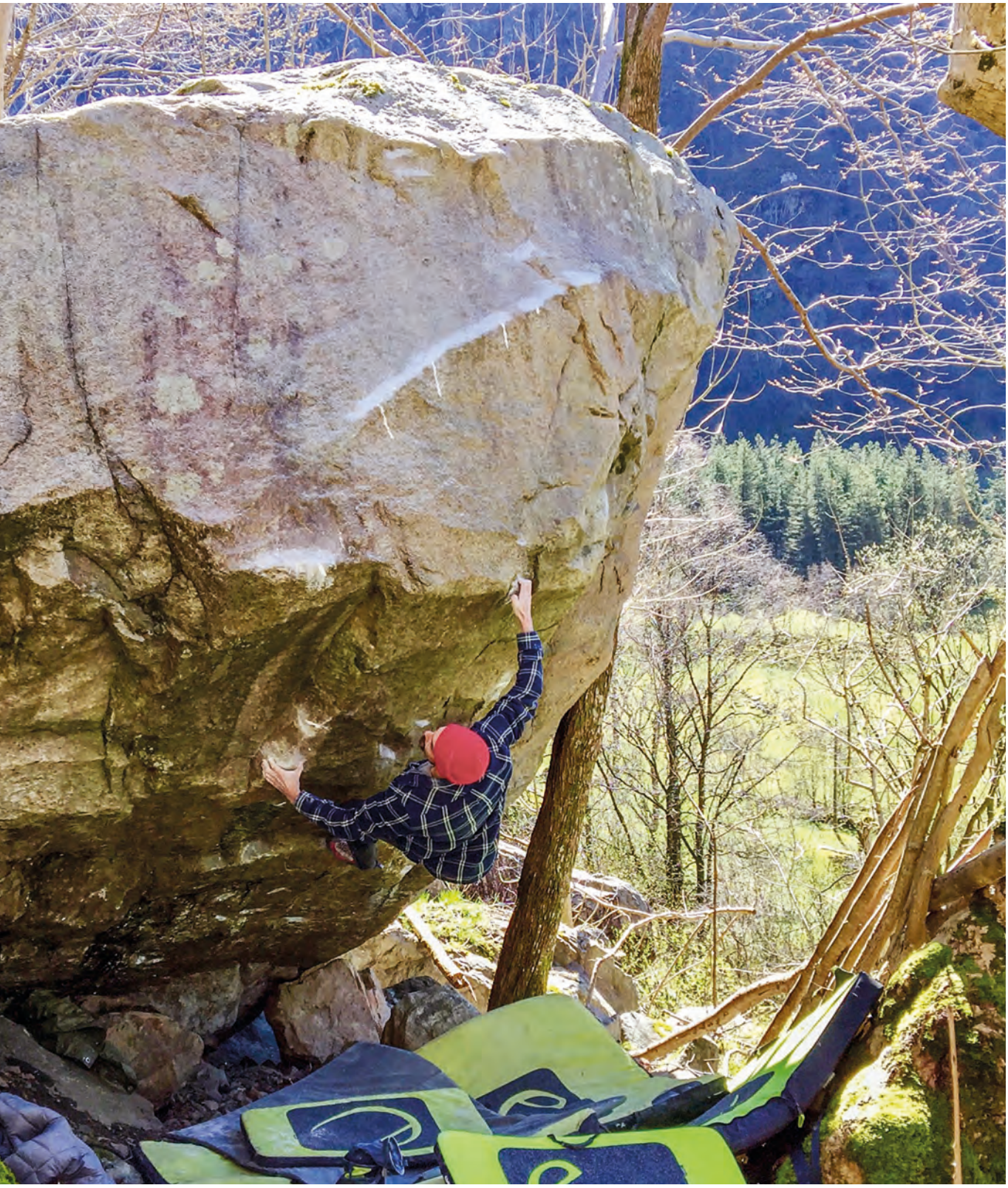


PHOTO: MARIA DAVIES SANDBU

BODY WEIGHT EXERCISES

While we recommend that strength training using additional weights should be done on its own, body weight exercises can be performed as part of the warm-up or at the end of a climbing session. As with climbing-specific strength training, we recommend starting general strength training with a higher number of repetitions at lower loads so you can learn the techniques and movements. Then, as you progress, you can increase the load and reduce the number of repetitions per set. We have mainly chosen exercises that activate several muscle groups at the same time because this reflects the complexity of climbing, where we use multiple parts of the body. We have also chosen exercises that are primarily aimed at muscles that work in the opposite direction to what we encounter in climbing, so as to create balance in our training.

1. PUSH-UPS

Push-ups are a good exercise for your shoulders, arms and chest. For the elbows and shoulders, push-ups train the opposite movements to what we encounter in climbing – pushing away rather than pulling in – and can therefore help to reduce the risk of injury related to these joints. It's an easy exercise to start with, and it's also easy to make it harder and more challenging.

Begin by standing on all fours with your knees on the ground and your hands about shoulder width apart. Lower your chest to the floor and push back up again without twisting your elbows out. When you're able to do three sets of 10 repetitions, you can up the difficulty by standing on your toes instead of on your knees. Do as many as you can each set, and complete three sets with a 2- to 3-minute rest between each set. When you're able to do more than 10 repetitions for three sets on your toes, you can start to vary the exercise by adding rotations, as seen in photos 3 and 4.

2. THE LARVA

The larva is a good exercise for your shoulders, chest, abs and back. The further you walk your hands in front of you, the more you train and utilise the full range of motion in your shoulders; it is particularly at the far end of this range that you need to build strength to reduce the risk of injury to your shoulders.

Start the exercise with both hands and feet touching the floor. Walk your hands as far in front of you as you can while keeping a strong core, then walk your feet back up to the starting position. Avoid dropping your hips or arching your back – you should feel your abdomen and back muscles working to keep your core strong, stable and straight.