

NICK BENDELI

AN INTRODUCTION TO NORDIC SKIING

compiled for

NORSKI

the centre for
NORDIC SKI EQUIPMENT

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SELECTING YOUR NORDIC EQUIPMENT.

The novice Nordic skier, like the novice downhill skier, faces a bewildering array of gear when he first enters a well-equipped shop. We've produced this booklet to help you blaze a trail through the under-growth of equipment-buying. Read it. Ask us any questions. Ask other dealers questions also. We admit that we look for your custom, but we are just as concerned that you buy the gear that will do the job for you and better enable you to enjoy this truly great sport of Nordic skiing. If what you need is here - marvellous! If it is not okay. At least we may have been of some help.

A BIT OF BACKGROUND.

Nordic skiing isn't a new sport. It has been around since 4000 B.C. The gold miners at Kiandra fashioned their own skis and held competitions last Century. After Sondre Norheim produced a toe-piece and heel-strap binding, he developed two turns, the 'Telemark' and the 'Christiania' which took the Scandanavian 'over-the-snow' means of transport into the realms of sport. The British tourists later took the equipment they got in Norway to Alpine countries. Until the 1940's all skiing was essentially cross-country as the downhill skier had first to climb the mountains and traverse the ridges before he could ski down. With the development of the ski-lift the equipment used by the Alpine skier became more and more specialized. His need for climbing as well as sliding on skis was over. What he needed was a more rigid and positive union between boot and ski to enable the alpine skier to cope with the steep descents and high speeds, of downhill skiing. Nordic skiing also, branched off into specialized gear. As the need no longer existed for heavy wide skis and heavy boots and bindings to give a high degree of control downhill, the Nordic equipment manufacturers turned their attention to increasingly lighter and more flexible skis, boots and bindings. Modern techniques have now produced Nordic skis, boots and bindings, a quarter of the weight of similar Alpine equipment.

Let's look at this Nordic gear.

SKIS.

There are three general categories of Nordic Skis. (1) Wide skis, generally about 56 to 60mm wide at the binding and 70 to 75mm at the shovel. (2) Nordic racing skis which are about 46mm at the binding, are often of exotic construction with balsa wood cores or with air-channel cores. (3) Between both extremes is that group of skis known as Tur-lagrenn, Tur-lett or Latu which is best rendered in English as light touring skis. These skis represent the greatest significant advance in ski engineering for the tourer in recent years. They combine the lightweight construction techniques of the racing ski with the stronger materials of the traditional wide touring ski and the result is a light, flexible ski of great strength. They are sufficiently strong to be used under virtually all skiing conditions and their lightweight makes them more responsive and far less tiring to use. This type of ski dominates the market by a wide margin.

WHAT SKI FOR ME?

A difficult question, my friend. Where do you plan to do your skiing? If it is going to be largely local or in any area characterized by gently rolling terrain, you can use the lighter skis to advantage. If your touring will be largely with groups over broken-out trails or easy ground the lighter ski will still do the job. For the packpaker or the man who goes in any terrain regardless of how rugged or steep it may be, the wider ski may be necessary. If you have never skied, you feel that your ankles are weak or your balance is less than average, the added stability of the wider ski maybe of assistance initially. If you are the athletic type, in good health, vigorous and with good balance the light touring ski is unquestionably for you. If you are that healthy, you may even want to have a crack at ski-running or cross-country racing which is reputedly the most physically demanding sport in the world. The out of shape skier who is on the snow regularly soon finds his condition has improved so markedly, that the prospects of the lighter skis with definitely zingier performance will appeal for greater achievement and enjoyment.

SKI CONSTRUCTION AND PRICE DIFFERENCES.

If you are accustomed to the prices and price differences in Alpine equipment, the low cost of Nordic gear will astound you. So will the fact that there is so little difference in cost between an adequate ski and the very best ski. The lowest priced skis are made of a single strip of birch. They keep you on top of the snow period. The next step up the line is the typical Swedish ski, which is of several laminated layers of birch. The laminations assist in the retention of camber and add considerable strength to the structure. Birch by itself is light and tough but it warps wonderfully well. The next upgrading is the refinement of hickory edge on the sole of the ski. Hickory is much stronger than birch so the edges stay square much longer. You give away a measure of downhill control in any Nordic ski but to sacrifice more by not insisting on hickory edges as minimum is an ill advised economy. We make that decision easy as we do not carry the birch skis. We do not recommend a ski that does not have at least a hickory edge. The next upgrading in quality is the ski with a hickory sole for increasing wear resistance. Hickory is very slightly inferior to birch in wax-holding but its vast superiority in strength and durability makes it far more desirable.

The major upgrading in Nordic ski quality comes with a multilayer laminated construction. This is common to all Norwegian skis and some better Finnish skis, but it must be noted that the core of Finnish skis, has generally, a greater percentage of softwoods than does the Norwegian skis. The fabrication technique is essentially the enclosing of a light weight core of laminated softwoods and hardwoods with one or more layers of laminated hardwoods. The result is a ski of optimum camber with a gradual softening of action to a flexible area around the shovel and the tail. This design provides the best contact between the ski and the snow surface and provides maximum resilience and strength for maximum weight. The next upgrading is provided by fibreglass reinforcements in the ski. This refinement, incorporated in the Kongsberg, Skilom and Toppen skis, augments strength with no loss of

flexibility and improves the ski's ability to retain camber. There are a few others that add to a ski's durability that need mentioning. One is a metal dove-tail that clips onto the heel of the ski. It prevents delamination of the ski which may occur from setting the tail of the ski in the snow or a puddle of water. The last refinement found on top-of-the-line skis is the lignostone edge. Lignostone is beechwood compressed to about a seventh of its original volume in an oil and resin medium. It is flexible, very tough and seems to wear indefinitely on crusty snow. It is the optimum edge for the touring and light touring ski. The all out racing ski usually has a birch sole with a hickory edge, but it may cost more than the full hickory soled, lignostone edge light touring ski. The price difference is due to the internal construction. Long life (at least beyond the end of the race) is not a requirement for the all-out racing ski.

The cost differential between the adequate birch with a hickory ski and a top grade Norwegian ski, based on 1974 prices, is about \$10! The top Kongsberg ski sells for about \$40. A fine quality Norwegian ski not the top, but with all the refinements sells for about \$35. Plastic and metal Nordic skis are now available. Some of which have metal edges. In our opinion, generally, they do not, yet, offer the versatility of the better grade wooden ski. They appear to be stiffer and therefore will tend not to present the full waxed surface to the snow in the wide range of conditions met in Nordic skiing. The all round performance and the wax holding properties of these skis do not yet appear to be as good as a hickory-soled ski.

Waxless skis such as those with pile strips or fishscale plastic soles are now on the market and would seem to remove the problems of waxing. Suitable conditions are required for them to perform as effectively, in Australian conditions as a correctly waxed hickory-soled ski. It is early times yet in the development of plastic, metal and waxless Nordic skis. Who knows what will be produced next year. Perhaps a ski, boot and binding combination that gives the lightness and versatility of Nordic gear, the strength and flexibility

of the multilaminated wooden ski, the positive control of Alpine equipment, is waxless but performs correctly on all types of snow conditions.

SUMMARY ON SKIS.

1. The best costs so little more than the cheapest and lasts so much longer and performs so much better that it is false economy to buy on price alone.
2. A flexible ski of multilayer construction is generally a strong ski. Stiffness does not indicate strength. It usually indicates the opposite, as the brittle unyielding ski is the quickest to break.
3. If you are unsure of the width of the ski to buy, do not be afraid to sacrifice a little performance for the added stability of the wider ski. Once you have learned, you can always go to a lighter ski.
4. If you have never skied Nordic before, we are confident that you will be delighted with the light touring skis for your next pair of boards. You have nothing to lose but half a kilo of wood from each foot.
5. The basic rule of thumb for the size of skis is that the length of the ski should be to the base of the wrist of the up-stretched hand. If you are light for your height, have never skied, or are singularly unathletic, go down one size.

TOURING POLES.

The traditional Nordic pole is bamboo (tonkin is the same thing) which is light, flexible and remarkably strong. The better poles have adjustable straps and handles with a little bump on the top rear of the handle to facilitate the release and catch of the pole. Fibreglass is used by the serious skier, as they offer vastly increased strength and driving power. They are far more costly than tonkin. There are aluminium poles available which perform quite well, but they are far more costly than the fibreglass. We cannot, in all honesty recommend aluminium poles to the recreational skier as they tend

to dent when hit against trees, posts etc, and then fold about the dent when weight is applied.

For the average skier, the properly fitted pole comes to the armpit with the tip on the floor. The stronger skier may go for a longer pole as it gives him more push. The less than average skier may go for a pole that fits under the armpit as the pole is easier to use.

BINDINGS.

Bindings are classified as either cable or toe. The toe binding consists of a light alloy arrangement attaching the toe of the boot to small pins. This arrangement holds the toe securely and gives good lateral support. It is required for racing skis and highly recommended for light touring skis. It can be used on the wider touring ski but if maximum control is required the cable binding is usual. The cable binding consists of heavy toe-irons of adjustable widths with a cable or heel-strap to pull the boot forward into the toe-iron. This binding is used for wider skis as it is more durable and allows greater ease of control. They are considerably heavier than the toe bindings and some may be so wide that they should not be installed on a light ski.

BOOTS.

Boots for Nordic skiing are generally divided into three classes. (1) The above the ankle, single or double laced touring boot, which may or may not be insulated, is commonly used by backpackers or those going into deep snows. It is most suited to the cable binding and wider ski. (2) The below-ankle boot is popular with the occasional tourer who moves at a genteel pace and never really gets warm. It is suitable to both toe and cable bindings and light-touring and wide skis. (3) The third type is a shoe which fits the toe binding and light touring ski and is much lighter than others. The slipper is an ultra-light creation that is designed for racing although the vigorous skier may find them suitable for a fast run such as from Perisher to the Chalet and back before breakfast. The

slipper is not recommended for normal touring as it offers no insulation to speak of and is not sturdy or robust enough to give the control required for off the track tours. All boots should have vulcanised soles with a metal insert predrilled to take the bindings of your choice. Leather soles tend to leak and, with use, the stitching to stretch and the welt to buckle. All-rubber boots tend to be too hot for normal conditions in Australia.

Many people begin touring with new skis and bindings and use an old pair of work or hiking boots. Since suitable touring boots will cost from \$19 to \$25, we recognize that the ability to utilize an existing pair of boots is a saving. However, you will enjoy Nordic skiing more with the light, flexible special purpose boot. It is designed to do the job. If you do not choose to make the investment in a pair of touring boots, bring the boots that you intend to use with you on your next visit and we will see if they can be used satisfactorily.

CLOTHES.

Tourers the world over use shell parkas and knickers made of lightweight dacron-cotton blends, but while this garb is indeed more comfortable, almost anything will do provided it is loose, comfortable, wind-tight and moisture resistant. The general principles of dress for winter activities apply as follows:- Dress in layers that can be removed for active skiing and put back on when you stop. Something loose and warm next to the body to trap the body heat and something wind and waterproof on top to keep the cold and moisture out. For a quick run around the hut, we opt for knickers and windshell over a shirt, over a fishnet singlet. If it is cold and windy, a light woollen jumper does the trick.

A long tour, a full day of instruction or a trip with a group demands more extensive preparation. A parka and other items of a similar nature stuffed into a pack should be carried in this instance.

WARNING: An extended tour particularly in mountainous terrain should be treated like any other expedition - with great respect and should be planned accordingly.

Pick a plan. Tell others about it, stick to it. Ask us for advice for what you propose.

WAXES AND ACCESSORIES.

Waxing is a little world of its own, but a much simpler one than you think. The supposed 'Problem' of waxing has probably deterred more skiers from enjoying touring than all the other factors combined. But we cannot for the life of us see why. Let's tackle this problem by examining what happens when your skis hit the snow:-

It is obvious that if you start walking or running on skis, that one ski must be firmly planted on the snow to push against, while the other ski shoots forward and glides like an ice-skate across the snow. You then ride the gliding ski, roll your weight forward over your boot to plant the ski, kick or push off on it, and shoot the other ski forward. You do the same thing when you walk, except that you do not glide on your forward foot. So far, so good. If you were skiing all the time on fresh, fluffy snow at below freezing temperatures, you wouldn't need any wax at all because fresh, fluffy snow, has a sharply crystal structure - a tooth - that bites into the ski, and enables you to plant the ski firmly to push off again. The eternal joke is that fresh, fluffy, dry, cold snow is a sometime thing, and when it happens it does not last long. Snow is a plastic medium i.e. it changes physically by means of movement and by temperature. The dry light snow of morning has, by late afternoon, settled and in the act of settling has rounded the corners of the crystals. Not much, but enough to destroy the 'tooth' and let your skis slip backwards. Perhaps the upper layer of snow has melted in the midday sun, and the afternoon shadows have altered it into minilumps of snow and ice. Anyhow, the snow changes, and as it changes, your wax should also, to cope with this change. Snow is defined as new snow, settled snow and old snow.

Waxes themselves are not very mysterious. Some are referred to as hard or stick waxes and they generally come in little foil cans. To use them, you simply peel the can.

The soft wax, or 'Klister' (it means glue and you will see why when you use it) usually comes in tubes like toothpaste. The stick ones are made of a mixture of natural wax and synthetic resin, similar to the stick on sticky tape. The colder the snow and the newer the snow the more 'tooth' the snow has, and the easier it is for the tooth to penetrate the wax, so the harder the wax to be used i.e. more wax than resin. As the snow alters and the temperature rises, you'll need a softer wax, with more resin, to allow the blunted tooth to bite the wax. Above freezing, you'll probably be using one of the Klisters. Klisters are pretty much straight resin, since they last longer in abrasive conditions, are used for old and granular snow.

We do not propose to cover the complete range of waxes and their individual uses, as these details are generally covered by the manufacturer with instructions on each tube or can.

The common waxes in Australia are Østbye, Bratlie, Swix and Toko. All individual waxes and klisters are coded with instructions for use. The colour coding varies between manufacturers, therefore, the range of application will vary between manufacturers. Individually, Østbye and Bratlie waxes have a broader application, and therefore, will have more appeal to the recreational and beginning skiers. In order of decreasing hardness, the hard or stick waxes are as follows:-

ØSTBYE

Green (Special)
 Blue (Mix)
 White (Medium)
 Yellow (Klistervox)
 Brown (Mixolinvox)

BRATLIE

Green
 Blue
 Purple
 Red

SWIX

Special Green
 Green
 Blue
 Red
 Violet
 Orange
 Yellow

TOKO

Olive
 Green
 Blue
 Purple
 Red
 Yellow

In order of decreasing hardness, the klister or tube waxes are as follows:-

ØSTBYE

Mixolin Klister
 Vat Snow Klister
 Skareklister

BRATLIE

Blue
 Red

SWIX

Blue
 Purple
 Red
 Yellow

TOKO

Blue
 Purple
 Red

DO NOT EQUATE one line with another, as the range of a wax varies from maker to maker. If you follow the instructions printed on the containers, and use the wax within the stated range of conditions, you should have little difficulty.

We have talked about what waxes are, and how they work now let's get down to the nitty gritty of waxing application.

Let us begin with the ski. If your skis are wooden, good quality skis, you will need only to apply a tar-like substance to the base of the ski. In the past, it has been necessary to scrap the sole bare and burn in the tar with a blow torch, and although purists still use a burn-in tar, you need not be so fussy. Østbye, Bratlie, Swix and Toko put out a base tar in bottles and spray cans which is air drying. This is quick, easy and relatively simple to use. This base-tar takes the part of a primer as it both protects the wooden ski and gives a surface on which the waxes can grip. If you have spent a day or two skiing on crust, you will probably find, even on hickory soles, some scars on the sole of the ski. Touch up the area with a little spirit on a rag, sandpaper if necessary, and reapply the tar over the the scrape. Simple? Of course it is. Ski touring is a beautiful sport and contemporary tars and waxes which simplify and degunk the process only enhance its popularity. Metal and plastic skis have a plastic sole and do not need tarring, but are best given a hard base wax instead. We now have a pair of skis ready for waxing. Look through your wax kit and find the hardest wax you have. This will probably be a green or blue. Peel the foil off the can and dab the wax along the ski until you have a fairly thin coating. Spread this out with your waxing cork (which may or may not be of cork) until the coating has no major gaps in it. Polish the wax until it

glistens iniformly. Yes, it is work, but do it well, and you will not have to do it often. You can do as I do, and use the heel of your hand or your thumbs. It is faster, but messy and painful if your hands are soft. The wax that sticks to your hands can be removed with kerosene, hand cleaner or petroleum jelly. But an hour of skiing will sweat it off anyway. This base-waxing is best done at home where you have the time, both the ski and the wax are warmer, and so more readily applied, spread and polished. We now have to apply the running wax.

As previously mentioned, it is not the object of this booklet to become involved in the detail use of the full range of waxes, but we do suggest a simplified waxing system that will get you on skis quickly, with no grief, and to cope with a lot of snow conditions you will meet.

It's a system by Østbye called DUO. A neat little kit with two tins of wax. One Blue and one Yellow. Østbye, the original manufacturers of skiing waxes, have packaged it and its brother TRIO for novice skiers. The system is simple and consists of Blue for dry snow and Yellow for wet. The Blue, or Mix Wax applied and rubbed out is the basic running wax. If your skis slip backwards when you slip, add more Mix on the two foot length of ski under the binding, don't rub it. If you still slip, add some more Yellow or Klistervox to it in the same place and polish it. Still slipping, put Yellow over the whole ski, and DON'T rub it. Do not include the tip as this can stop the tip riding over mounds of snow. Think that's difficult? About as difficult as facing a long cool drink after a day's touring.

Using this binary system is effective, particularly for the beginner Nordic skier who is experiencing difficulty while climbing and who is bewildered by the large ranges of waxes available. The waxes do tend to inhibit the long fast glide of the expert Nordic skier, but by that time you have been on skis long enough to develop that kind of technique, you will be proficient in waxing, selecting the right wax for you and applying same.

Keep this binary system in mind and you'll find it less confusing when you first go Nordic skiing. Some of the hard waxes are useful over an extremely broad range of

conditions, particularly Østbye Blue and Yellow and Bratlie Blue and Red. With a little finangling and good skiing skills you can manage a lot of skiing on these waxes. You will find that you can extend the useful range of any wax by rubbing it out if you need a slightly harder wax and by applying it roughly if you need a softer wax. Remember what we said. Begin with a rubbed hard wax, if you slip add the same wax underfoot (known as 'Kicker') roughly. If you still slip, add a softer wax, as this will allow the TOOTH of the snow to bite into the wax. First a kicker and then the length of the ski except for the tip. The same procedure holds true for the more complex system. Remember, it is easier to apply the waxes indoors where the skis are warm and dry and the waxes are warm. If you have to apply waxes out of doors, get the sole as dry as possible, and warm it with a blow torch, (not the plastic soles) over a fire or by placing the ski upright and facing the sun. Warm the waxes or klusters by placing them in a plastic bag and putting them in your pocket or some other place to be warmed by body heat. I always carry a number of plastic bags for this purpose, as the cans and tubes can become very messy and leak. A pocketful of loose klusters is a horror not to be contemplated.

In selecting your running wax, begin with the hardest wax that you think might just work. Allow a little time for the wax to reach the outside temperature and then ski for a 100 metres or so to set the wax. If you slip back when you kick, add the next softest wax under the foot of the ski as a kicker. It is easier to spread soft wax over a hard wax. Reversing the procedure is like spreading cold butter over honey on a piece of bread. Once you have discovered that you can climb without slipping back, and glide without being glued to the snow you'll be in a better position to experiment with borderline conditions of waxing. The experience others is useful, but bear in mind that the novice whose technique is a bit raggedy will require a softer wax to climb well on a slope than the expert who flies up with the hardest wax available on his skis. Make no doubt about it the technique of skiing does alter one's approach to waxing. As your ability improves - and it

will rapidly - you will find yourself starting out with, a Yellow wax on your skis, and, for the first time, being more conscious of your slow speed downhill than of the difficulty of climbing a slope. You stop, scrape off the Yellow, and put on a thin coat of Purple. 100 metres of skiing to set the wax and suddenly you're flying, zooming up the hills with no effort, and eating up the flats in long strides. The fledgling Nordic skier still needs his Yellow though, because his technique is not as good as yours, but the guy ahead is skiing on Blue with a touch of Purple as a kicker, and he is flying!! All on the same piece of snow.

To help you, we make a few comments which may be of assistance.

Waxing is no more than matching snow conditions with the characteristics of the wax. The more you know about the snow the easier the job of picking the right wax for it and you. Remember that conditions change from valley to mountain and from morning to midday to afternoon. So wax for the average with emphasis on glide. Consider the snow conditions by picking it up and handling it. Consider the temperature by use of an outside thermometer.

Until you know more about it, stick with the one brand of wax until your experience and technique has improved sufficiently for you to take advantage of the full range.

Dab on sticks and squeeze on klisters. Try not to get wax in running grooves as it is difficult to remove and does not allow the groove to break balling up if around the hut and in the pack. It helps you to spread the wax evenly and thinly. I use a torch in conjunction with a 2" paint scraper so that the heat is transferred to the wax and spreads easily. I also use the 2" paint scraper for removing wax. It is easier to remove wax with a Butane torch and kerosene but remember if your skis have a plastic sole, that the heat from the torch may also remove the plastic sole.

As previously mentioned, wax is best removed from wooden skis by means of a torch such as the Primus disposable

Butane can and a paint burner which is easy to pack and light to carry. As far as plastic soles are concerned, I find kerosene or degreaser the best thing. You can soften the wax with kerosene or spirit, and use the scraper to remove most of it. If you are particularly fussy, use a kerosene soaked rag to remove the last vestige of wax on the sole. The kero-soaked rag comes in handy for cleaning the top and side of the ski. Be careful that you do not draw out all the base tar. If this has been done, warm up the skis to evaporate all remaining spirit, and touch up again with your spray or paint-on base tar.

As your skiing technique improves, you'll find you are more concerned with maximum slide. Therefore wax for maximum glide. Remember it is easier to put a soft wax over a hard wax than vice versa. The old saw is worth noting 'If the skis won't slide, the wax is too soft, if the skis won't climb, the wax is too hard!!

Remember the wax is only as good as you make it. It is only an aid. Therefore, think about what you are doing and how you can get the best out of the wax that you have on. If you are slipping, pick up the skis from the snow, as this will allow the water in and adhering to the wax to freeze and so give a better grip. Slap the skis back down on the snow to grip the wax. If you are sticking and balling up, shuffle your feet and push them through the snow so that you do not allow the moisture in the wax to freeze and collect snow. If you are balling up too critically, try and find a patch of ice on which you can ski, which will clean off the snow which is sticking to the sole and also help to wear off some of the wax and so help to make your re-waxing job easier. I find it a very good idea to carry a stick of wet-snow downhill wax so that if balling up becomes too great, particularly before a downhill run, apply some of this and so allow the skis to move. The downhill wax will have worn off by the time you reach the bottom of the slope, and you can climb up the other side quite easily. Paraffin will do the same thing, but it is not so easy to apply.

Petroleum jelly comes in handy as it will remove tars

and waxes from your hands and clothing and from the top of your skis. It can also be applied to the undersole of the skis instead of paraffin or wet downhill wax for the same purpose. It comes in handy if you apply it to the heel of your boot and heel plate as it stops the build up of snow in this area. Petroleum jelly will eventually disappear so do not rely on it too much.

Once you have some experience and technique, experiment so you can find what waxes work for you, and under what conditions. Remember klisters are basically for abrasive granular snow, either wet or dry and stick is for new snow either wet or dry.

We hope that we have been able to assist you with the notes, and that they have put you on the right course for enjoyable Nordic skiing. Should you have any further queries on waxing or just Nordic skiing in general, the staff will be only too pleased to assist.

HAPPY SKIING!

NORSKI!

By use, WNSWBW.

heny	-160	-120	-90	170	190	200	10	190	190	380	180	200	230	430	430	*	*	30	50	-150	-130	-330
Wey	110	-30	220	230	-50	-20	230	250	250	-250	-420	-370	-360	-330	-290	90	210*					
they	-80	-30	-30	170	220	-60	-60	60	-190	-190	-150	-130	-70	90	210*							