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Please send comments or questions directly to Arthur Boon!!

Detail and pictures on the homepage: http://members/tripod.com/razorgate

The Straight Razor
Author: Arthur Boon

PART 1

1.00 Introduction

Starting its evolution as a scraping stone a thousand years ago, the straight razor gradually developed into what proved to be one of the most perfect and simple instrument designs of all times. The weight is very well balanced, the blade is easy to clean and thus hygienic, and the blade geometry is designed to conserve an ideal edge with relative little equipment and effort for many decades, even generations, as a well treated straight razor has an almost unlimited life. In addition, when the skin has adapted to the change, the superficial peeling effect of the straight razor makes it suitable even for the irregular skin that suffers from the irritations caused by electric or safety razors.

Little practice is needed to switch to the straight razor for the rest of your life, and to discard the alternative messy compromises as just non-functioning make-believe products of fast consumerism. Then what caused the decline of straight razor use? One of the factors contributing to that has been the inappropriate knowledge about maintenance among users but also among manufacturers and designers, which coincided with the upcoming market consisting of gadgets such as auto strops, rotating razors, and safety razors. This unnecessarily caused the straight razor to function far from optimal, but still comparable with the new inventions, which of course was the beginning of the end.

Also, ghost stories about dangers to damage the vital vessels in the neck with normal use made the picture complete, although a highly polished push cutter has little slicing capabilities, and a home full of stabbing and dull cutting tools presents a much higher risk to playing children and pets than a clasp razor stored in a box on the upper shelf in a cupboard.

At present a few manufacturers each produce a few thousand straight razors a year, with some emphasize on collectors' items, a number that slightly increased in the nineties. The dedicated user faces the impossible task to collect contradictory information from several more or less reliable sources which all suffer from the fact that almost nothing of the theory which came down with generations has been published for future reference. In fact, the art of straight razor use and care is an example of lost knowledge. The purpose of this document, is to present a forum for discussion and convergence of knowledge on this topic, in order to re-introduce this 'non plus ultra in der Hand des Selbstrasierers'.

At the end I included detailed abstracts of two historically important books. When the advises are followed, success is just a matter of developing some skills. It takes about a few days to a maximum of 4-5 months to master this technique. Persons already using the straight razor for decades will be surprised that they can improve results significantly.

I had a coffee at McDonalds recently, and read a warning: This Coffee Is Very Hot. On the same level, and just to prevent US jurists to jump on my back, a warning is appropriate to those who are extremely careless. Not only will they risk injuring ears, nose or throat, they will also spoil the edge of the razor, which then stops to shave. It is possible to deliberately cause life-threatening injuries, as with most tools; such as when walking with an open razor, or when you try to cut your throat, but the risk of injuries at normal use are small. Of course, this is your own responsibility. Aviation rules: transport in its case, in your hand luggage. Any regulations coming from fear for infections such as hepatitis or HIV of course only aim at barbers, not to those people who have their own razors. It is important to realize that the square head blades have a potential stabbing spike, and that the round points are equally effective in shaving a single hair in a corner, and even are required to save the lower lip effectively.

1.01 Manufacturers

DOVO Stahlwaren, Postbox 190146, D-42701 Solingen, Germany.
Address:
Bocklinstrasse 10, 42719 Solingen, Germany
Telephone: 0049-212-23-0-01,
Fax: 0049-212-31-36-12.
E-mail: dovostahlw@aol.com (Mr. J. Schremml).
Netherlands:
Robijns B.V., Hornweg 196-C, 1432 GS Aalsmeer.
Phone: 297-24-60-53
Fax: 297-346-212.
United Kingdom:
Brian H. Northcott, 56 Cuckmere Road, Seaford, East Sussex BN25 4 DJ;
Phone: 323-89-55-37;
or:
Geo F. Trumper, 20 Jermyn Street, London SW1 6HP.
Austria:
Morocutti Knifeshop, Vienna (see homepage).

Old Rock hones
The best hones used for centuries are the Belgian Old Rock, produced in the Ardennes.
Address:
Ardennes bvba/sprl, Hulststraat 6, B-3600 Genk, Belgium.
Phone/Fax: 89-350-502.
E-mail: maurice.celis@skynet.be.
The atelier is at Rue Petit-Sart, B-4990 Lierneux, Belgium.
Phone: 80-418-294
Fax: 80-418-295
They are still exploiting the mines, but due to recent earthquakes, they have some limitations on sizes.

1.02 Geometry

Orientation used in the description: the handle pointing to the right, blade to the left, cutting edge pointing downwards.

Definition terms and their translation:
Kopf/Point/Bout/Punta: the left end of the blade.
Ruecken/Back/Dos/Lomo: the part of the blade opposite the cutting edge.
Schneide/Cutting Edge/Tranchant/Corte: (pointing downwards) the sharp edge.
Erl/Tang/talon/Espiga: the complete non-cutting metal part fixed to the blade, serving as a grip for the index, middle, ring, and little finger.
Doppelansatz/Double Stabilizing Piece/Double Piece Stabilisatrice/Doble Pieza Estabilizadora: two close parallel vertical rims situated where the tang continues to the cutting part on the knife. Sometimes there is only one stabilizing piece.

Kranzangel/Decorated Tang/Talon Decore/Espiga Decorada: some sort of art where the blade stops and the tang begin.
Schale/Handle/Manche/Cacha: the part of the razor that contains the blade when closed.
Einlage/Inlay/Marque/Marca: text, mark on the handle.
Steg/Center Plug/Rivet Central/Remanche Estabilizador: the middle plug on the handle;
Hohlung/Hollow Ground/Evidage/Filo Concavo: the biconcave form of the blade in transection view.
Goldaetzung/Gold Etching/Gravure Doree/Grabado Dorado: the mark or text on the blade. Zeichen/Trade mark/Marque/Marca, the mark/text graved on the tang.

The Ridge/Der Wall: parallel to the back and the edge, running from point to the stabilizing piece, is a thickening of the blade, the purpose of which is to stabilize against torsion in the horizontal plane, and to give the edge elasticity. The stabilizing piece gives the blade torsion resistance in the vertical plane. If the ridge is close to the edge, it is called 1/4 hollow ground, the lowest grade of hollow ground; if it is close to the back, it is called 1/1 or full hollow ground; 1/2 and 3/4 are in-between. More on grind types below.

Grind Types:
Flat and hollow-ground.

Derbes Messer/Flat Ground/Le Rasoir Plein: the cross section of the blade is a triangular shape
Hohl/Full Hollow Ground/Creux/Concavo: biconcave cross-section; something in between (1/2 or 3/4 hollow).

Points:
Round Point/Rundkopf: the point is rounded.
Square Point/Gradkopf: the point is square, forming a spike at the transition between point and cutting edge.
Something Inbetween: Franzkopf

Blade Sizes (Width) Are: 3/8", 4/8", 5/8", 6/8", and 7/8".
Determination: A double stabilizing piece (two vertical rims between tang and blade) implies 1/1 (full-) hollow ground, but some full hollow ground blades have no stabilizing pieces at all, but instead a smooth transition between blade and tang. Theoretically, you might confuse a single stabilization piece (which indicates less than 1/1 hollow ground) with these types of full hollow ground blades but there is a difference which can be seen with the full hollow ground Bismarck or Renaissance (DOVO) types of blades. The Bismarck shows a smooth transition between blade and tang, lacking any rim, and therefore is easily identified as full hollow ground. The Renaissance has one rim, which might indicate either less than 1/1 hollow ground (cheaper) or
full hollow; however, the fact that the rim is not confined to the blade, but runs through into the tang, identifies this type as full hollow ground. If the transition from tang to blade shows one vertical rim that is confined to the blade and exactly vertical, it must be a flat ground or 1/2-3/4 hollow.

1.03 Principles

In the beginning, straight razor blades were wedge shaped; the sides of the blade were straight lines, not concave (hollow). These blades shaved as perfect as the later hollow ground blades, if sharp, but had some disadvantages. First, they were heavy, compromising balance. Second, due to the wedge shape, the sides of the blade above the cutting edge instead of the edge itself primarily touched the hone surface while honing. Third, after years of daily use, the regular honing caused rapid thickening of the edge width, thus making sharpening increasingly difficult and time consuming. Therefore, the next step was to clear the blade sides from the hone surface, in order to reduce weight, and to use the back as a

guide for keeping the correct angle of the cutting edge, with which it forms one plane. This was done by grinding away metal between the cutting edge and the back with a wheel, resulting in a biconcave, hollow ground blade (at first without a ridge), combining an extremely thin blade with a very small cutting angle under 15 degrees. The disadvantage of this second step without a ridge was, that the ultra thin biconcave blades were unstable in the direction perpendicular to the plane of the blade. Therefore, the third step was to create a ridge parallel to the cutting edge, dividing the blade in two parts: an upper part between back and ridge, and a lower part between ridge and cutting edge. The ridge is created by grinding the raw triangular basic form with successive different wheel diameters: the greater wheel for the part between ridge and back; the smaller wheel for the part between ridge and cutting edge.

The result consists of two hollow grind blade divisions separated by a thicker ridge, with hardly visible smooth transitions. The closer the ridge is to the back, the more the type goes from 1/4 to 1/1 hollow grind. The ridge presents stability and vibrations which add to cutting performance, which can be identified by transversely rubbing the thumb carefully over the edge, causing a ringing sound. The ridge is not that thick that it touches the hone, of course, and you can hardly see or feel it. The three parts (two concave parts separated by the ridge) are identified under a sharp light: the ridge diverges the light and is therefore identified as a linear shadow, parallel to the edge. The full hollow grind blades have the ridge at about a little
below halfway between back and edge; lower grades of hollow ground just behind the edge, or somewhat further to the middle of the blade. A full (1/1) hollow ground blade keeps a very thin edge even after a lifetime of honing and stropping; a 1/4 ground blade edge rapidly thickens after years of honing, because of the proximity of the ridge to the edge.

1.04 Purpose

In general: the higher the grade of hollow grinding, the easier it is for the customer to keep the blade in perfect condition with relative ease (stropping and sometimes honing). Flat ground: in general for heavy and less perfect shave, for contour shaving, hospitals, etc. Full hollow ground for thorough and precise shaving. 3/8", 4/8": hospitals, eyebrows, and a very soft beard. 3/8" and 4/8" are mostly flat or half-hollow- ground. 4/8", 5/8": preferred for daily shaving, especially 5/8" which has more torsion resistance. For persons with very large hands and/or handicap the 6/8" and 7/8" were originally designed, but they also have very good torsion resistance and shaving characteristics.

1.05 Materials

Blades are made of normal steel with a carbon-content of 0.6% or more, and of rust-resistant chromium-steel. Carbon steel is easier to sharpen but more brittle, liable to chipping off and staining. Stain-resistant steel takes longer honing, but the results hold longer, and the edge is less vulnerable. Handles are made of Ambonia, Celluloid, Bone, Pakkawood, Mother of pearl, Ebony, Buffalo horn, and Plastic.

Celluloid is flammable and spontaneous inflammation has been described at higher natural temperatures. Even now, celluloid production is associated with extreme safety measures. Buffalo Horn can deformate after some time, increasing the risk of edge damage when closing the knife: it has form memory, but for the wrong form. Mother of pearl is brittle, which might result in cracks soon. Plastic is very thin and easy to deform, causing increased risk that the edge touches the handle while closing it. The hardwood handles do not rot because they are highly impregnated with resins; the weight gives ideal balance. Bone is stable as well. Both packawood, snakewood, and bone are have the best material properties for intensive use.

1.06 Collecting

Bismarck, Renaissance, and Bergischer Loewe are DOVO designer razors, primary for export as collectors items. They are available in 6/8" and 7/8". Besides their size (see above), there is no practical or qualitative argument for buying such a razor. Further reading, see references.

1.07 Honing And Grinding

You can learn to sharpen any knife on a stone, and if you have experience, or use the right sharpening system you will get very good results. The principle of grinding any knife is restoring the gross shape of a blade according to it's grind-type (hollow, flat, or transitions); this is mostly done with machines such as grinding wheels. Grinding does not sharpen a knife. The principle of honing is to create a good cutting edge angle and the blade part directly adjacent to it, the relief. The relief is created by honing with a secondary angle on a stone until a burr appears, and subsequently create the primary angle (this is the cutting angle, which is somewhat greater than the secondary angle, but both under 25 degrees) to remove the burr. The relief/secondary/primary angle principle makes the blade more resistant for less than delicate use.

However, the primary/secondary angle/relief principle does not hold for straight razors. The cutting edge of about 15 degrees (primary angle) is followed by a biconcave (hollow) part, and a ridge, respectively. This unity keeps the edge ultra thin during its life despite honing and stropping, and on the other hand supplies the blade with enough rigidity because of the ridge. In addition, the absence of a relief with a secondary angle, clears the cutting edge while honing with the back resting on the hone surface. The back serves as a guide which conserves the primary cutting angle under all circumstances and the same applies to the strop. This implies that the primary/secondary angle story is not valid for 1/4, 1/2, 3/4 and 1/1 hollow ground straight razors. In fact, the ridge and the hollow grind part between ridge and edge, are some kind of relief-substitute, which is not a compromise at all, because it's function is delicate without requiring any force.

The German book referenced below states that only extreme abuse is a reason to restore the architecture with a grinder. As this results in blade reduction, the back must be reduced accordingly to preserve the correct cutting angle. If you care for the blade as a 'good house-father' self-honing and stropping is enough. If the damage is nothing more than just touching the edge with your nail, causing a little local flattening of the edge, then honing will be sufficient. On the other hand, when dropping causes a defect in the edge you will not get rid of it with honing, and this needs repair with a hollow grinder.

At DOVO, the grinding is done by moving the blade between two wheels. After the grinding, they machine-hone on the side of a moving wheel, in the direction (!) of the edge and not towards it, until a burr appears. This is done with the cutting angle, so with the back just not (to prevent damage to the back) touching the wheel. On a second, finer, honing wheel the burr is removed, again with the same cutting angle determined by the back. Water is used on both wheels. Then the honing starts, on a very fine Belgian Old Rock and successively on an even finer one, called Escher waterstone, type Rasierstube.

The Old Rock is also called Belgian oil stone, but Dovo uses water. Razor Edge Systems suggests that any liquid, whether oil or water, creates a sludge with the metal and stone particles, rounding off the edge, thus causing blunting. This contradicts with the observation of German smiths, that a hone performs best when you create that sludge before starting, by rubbing the hone with a small stone and water. They state that ' especially when the sludge is present, the edge will be extremely polished and sharp'. The last hone in the process, the Escher waterstone, even comes with a separate rubbing stone, and a manual how to create the sludge. At DOVO, honing is done with circular movements, manually, with impressive speed. First on one side, and then the other, so not alternating. The result is obvious: the hones wear off

irregularly, causing a concave surface. Then they need a new hone. The reason for doing so is time-efficiency.

For the consumer who wants the hone to serve for an unlimited period of time, the following alternating linear method is better. Lay the blade completely flat on the stone and push it forward into the direction of the cutting edge, and slightly diagonally in the horizontal plane over the stone (the reason for that is to hone the complete cutting edge). Then turn the knife over the back without lifting it from the stone. Never turn over the edge, this will blunt the blade. Then repeat into the other direction; repeat this process about 4-10 times. Honing is enough when you feel a regular, smooth, cutting resistance when making a cutting movement from heel to point over your thumbnail with just the weight of the blade.

Some things are critical in order to get a sharp edge: the first is to ensure that the razor lays completely flat, so that the edge and the back touch the stone surface. This is to keep the exact required angle of the edge. The second is, that the razor remains flat on the stone during the movement. If you do not have experience, you will only succeed doing so if you hone extremely slow, and study the process carefully. Only then you will be able to observe that during the stroke, the edge or the back will tend to lift from the stone a millimeter on one side which you must correct, which is only possible when honing extremely slowly. Here, speed does not add up to better results, not even in experienced hands. This will give excellent results even for beginners (I tried it that way, with already immediate perfect results). The third is, that you do not press on the blade while honing: the weight of the blade is enough. Pressing will deform the angle. Hones should be large, because the surface is then completely in contact with the cutting edge; any damage or irregularities to the sides of the stone are then less critical because you will not reach them.

You notice that when you carefully make a cutting movement over your thumbnail; any knick feels like a sudden obstacle. It also gets damaged when you strop the wrong way, with the wrong paste, or when the razor gets into contact with aggressive agents (see below). The honing should be done only about once in one or two to twelve months in the following way: you probably preferably should have a large Belgian oil stone, completely smooth. Put some drops of oil (Buck's, or sewing machine oil, but no alimentary oil - no reason specified) on it. Cleaning the stone: Advises vary from cleaning with a cloth to cleaning with steel wool, or not cleaning at all. The ratio of cleaning is in removing metal particles out of the stone's pores, according to razor Edge Systems. Uncleaned stones kept their quality in their experiments, however. This still has to be cleared.

When you shave, the cutting edge gets somewhat misaligned microscopically. It looks like micro serrations, bending aside irregularly. If you put the knife away, the cutting edge stretches ('grows') spontaneously within 24 hours. After 3 or 4 shaves, it should be aligned a little bit again and therefore you must strop. If you do that correctly, and treat the blade well, you only need to hone once every year, and never send it in fro grinding. The game is, to postpone honing as long as possible, and to use the strop almost exclusively. Any other reports are due to wrong care.

Stropping occurs at the exact same angle as with honing but in the direction of the back instead of the edge. Stropping serves to polish the edge and to align any remaining mall alignment of the micro serrations. This implies that a hanging strop should be kept under tension to keep the angle correct. The former reports that the hanging-through would be beneficial for the edge, is incorrect, but may be this belief comes from experiences with plain blades (not hollow), as this will create a situation comparable with the primary/secondary angle/ relief story that applies to most knives. The hollow ground razor blade has only one single angle that should be conserved during all successive procedures, ranging from grinding to stropping. Hanging through will just round off the edge you carefully created before.

1.08 Strop Types

There are several strop types, each with its pro's and cons:
Leather only
Leather on one side and canvas on the other side: this is preferred above leather only because you first pre-sharpen on the canvas.
Leather glued on wood and adjustable strops: for flat-ground blades. If you let a hanging strop hang through while stropping, you will blunt the knife. This may be a reason for the inexperienced to buy this latter type of strop.

Juchten-leather: is more durable, and of better quality than Rind-leather. Hanging strops with leather handles are more expensive but more comfortable than those with metal clamps. Use a long hanging strop, this is treated in detail below.

1.09 Paste

White: chalk-containing fine cutting paste (mostly seen on hemp sides)
Yellow: just fat (mostly seen on leather sides).
Red and Green: coarse and very coarse abrasives.
Black: a polishing paste almost without cutting effect

Note: *do not use pastes, and certainly no cutting pastes, this will be treated in detail below. If you are experienced, you can use some fat on both the hemp side and the leather side, to make it a little sticky, but cutting pastes reduce shaving results by spoiling the edge.*

1.10 Stropping Technique

Strop only before shaving, after the edge could 'grow' for at least 24 hours, but preferably 48 hours. If you strop the edge immediately after shaving, the misaligned micro serrations behave as a burr, which will break off and penetrate the leather, which will turn into sandpaper. If you honed just before stropping, clean the blade with water and soap and dry with a cloth without touching the edge; this too is to prevent small metal parts to get stuck into the strop, which can damage the edge while stropping. Keep the tang between index finger and thumb and keep those fingers stretched. Place the blade flat on the strop. In case of a hanging strop, keep it under tension continuously, because if you let it hang through, you will create a round and therefore blunt cutting edge. Pull the blade over the strop away from the cutting edge and in the direction of the back. If you strop the other way in the direction of the edge (which is the case during honing), you will cut through the strop, or you will cause nicks, which will damage the razor. In the course of this stroke, take care that the complete cutting edge has touched the strop. The pressure of the knife on the strop should not exceed the weight of the knife, to prevent rounding and thus blunting the cutting edge. At the end of the stroke, keep the blade in contact with the strop, and swing the blade 180 degrees, causing it to rotate around the back; the back should keep in contact with the strop. Then do a stroke in the other direction. Repeat this about 10-20 times. Do this procedure first on the canvas (about 10 times) next on the leather.

Polishing (by stropping) is essential for the type of sharpness you need for shaving: it is not slicing sharpness but push-cutting sharpness. The edge surface must be extremely smooth to allow push cutting without any pressure, and to prevent deeper cuts.

The leather side of the strop should look dark and shining, almost like a mirror, for best results. This will gradually develop with good strops.

1.11 Testing

A sharp razor should cut a hanging hair. If you carefully rub your thumb over the edge perpendicular to the edge, you should hear a high-frequent tingling sound and it should feel a little sticky. The edge should bite into the skin. To detect any nicks cut very superficially over your nail. Any irregularity feels like a sudden obstacle. The nail method is not to test for sharpness, but for iregularities. You can also keep the edge towards a bright lamp; a sharp edge surface (not the blade) should not contain reflecting parts, because a sharp edge has almost no surface that can reflect.

A different technique came from Mr. Morocutti: make a cutting movement parallel to your arm, trying to cut a few hairs not directly above the skin surface, but 3-5 mm above. A sharp edge will bite into the hair, a blunt knife will not. If the hair test is positive but shaving not, the blade may be irregularly sharpened or the hardening process might be done incorrect. Try stropping again. A new blade must be stropped, and will perform better after a few weeks of use. 'The blade will be settled'. This is to encourage perfectionists.

The test for honing is mentioned under that paragraph. If a test fails, return to the previous phase and add 4-8 strokes.

1.12 Shaving

It is best but not necessary done after showering, because hair is saturated with water after 2 minutes contact. You need soap, definitely, to keep the water on the face. Even then, during shaving you suddenly might notice a rubber scraping like sensation, indicating drying out. Effective shaving stops immediately when that occurs.

Remove hair/soap from the razor with a finger and put it on a piece of tissue, or rinse. In the fifties, rubber rings were used for that, but were discarded because they chemically broke down after contact with alkali soaps. Keep the razor blade very close to the skin, just not touching the skin with the back, at the chin somewhat steeper. Shave with one or both hands. Shave twice: once with and once against the grain, but the upper lip only downwards to protect the nose. Contrary to safety razors and the protected scrapers, this will not cause bleeding. Start with the cheeks, then upper lip, then the neck, then the chin. Keep the tang (Angel) between thumb and index finger, the middle finger next to the index finger, and then the ring-finger and little finger at the other side of the handle, with the handle pointing upwards. Another variant is to keep only the little finger at the angle, but this reduces stability. With this grip you can shave most parts of your face.

Some parts and shaving against the grain need contra-intuitive grips which have only one thing in common, that the tang is kept between index finger and thumb. With those latter grips, keep your thumb and index finger as straight as possible for better control. Any 'impossible' grip will be a reflex within a few months. Where you place your other fingers in this latter case, is individually different. Always stretch the skin with a dry finger behind the blade. In the beginning, you will stretch ahead of the edge, but after some months you will find a way automatically to stretch behind the blade everywhere, although you will not believe this in the beginning. Stretching behind gives much better results and prevents nicks very effectively. Never shave without stretching, for obvious reasons. For the right cheek, put the left hand over your head; for the chin stretch between the index finger and thumb of the non-working hand. Shave in a perpendicular direction to the edge, do not make event discrete slicing movements. The upper lip should be shaved downwards, starting under the nose with a frightening steep angle for most people determined by the nose, then rotating and pushing downwards in one movement. This also will be an automatism soon. Rinse the razor with warm water afterwards, dry with a cloth without touching the edge, and store in a dry, ventilated place, not in the bathroom.

Razors should rest, for reasons specified above. Other opinions result from satisfaction with sub optimal shaving results. Therefore, it is best to have two, better three razors. The higher the grade of hollow ground, the better this self-curation.

Your skin might get irritated in the beginning, just as when you started with any shaving method dry or wet, but as soon as you regularly shave correctly, the irritation is far less or absent compared with any other shaving tool, partly due to the peeling associated exclusively with straight razor shaving.

1.13 Failures

Stropping with strops hanging through will round off and blunt the edge, as will pressing down on a strop or hone. A dull blade will cause cuts. Not stretching will cause cuts. Using the red and green abrasive pastes will spoil the polished (=sharp) edge you created just before - those pastes were not designed for razors. Dry hair will reduce performance. Fear for cuts will make you clumsy.
Wrong angle: too steep (small cuts), too small (tears and irritation). Swinging over the edge instead over the back when honing and stropping will blunt the edge, because you tend to touch the hone or strop with the edge first. Contact of the edge with aggressive chemicals;
Impatience: in the beginning, it takes double time compared with other techniques, but this will get better soon.
Perfectionism: you want results too quickly but it is a skill, an easy one, but a skill. Anyhow, that shaving with a straight razor is considered as a blood-speling torture is no reality and reflects severe theoretical and practical ignorance, as it spares the skin, unparalleled by any other technique. Other failures are treated below in Part 2 and three.

1.14 History

This is one example - perhaps out of many - of lost written knowledge, even in razor's musea and at the sparse firms that still make straight razors. Most knowledge is in the form of unpublished communications, letters, and resulting from telephone calls. Much is also personal experience. For the user I should advise to write to any of the firms mentioned above, not in the last place for them to realize the size of the potential market. DOVO has a large catalog. For collectors there are many places on Internet: search with HotBot or Internet Sleuth with the exact phrase 'straight razor' and you will find them all. One interesting address may be that of Lorenzi's: 9, via Montenapoleone, Milano, Italy, a razor's museum dealing with razor's history from prehistory until now.

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for his enthusiasm, the guided tour, and for taking the risk to borrow me the last specimen of a very valuable instruction book on razor manufacturing and care. Mr. and Mrs. Lorenzi for their kind and prompt response to my letter, for giving me Perret's book translated by Mr. Lorenzi. Mr. Morocutti from the Knife Shop in Vienna for the instructions 'on location'.

PART 2

Summary Of 'La Pogonotomie, Or The Art Of Shaving Oneself'
by Jean Jacques Perret, 'master of cutlery' written about 1790 (Italian/French) (ref 4).

2.00 Preface

It is astonishing that among the millions of books there is not a single brochure that teaches the art of shaving oneself. This is necessary, because it is virtually impossible for a barber to shave more customers without risking infections, and those who shave themselves have healthier skins. This is why I invented the 'rasoir a rabot' for novices who can learn to shave without accidents [Note: rabot is a sort of skin-protective cover on the blade, to be removed when experience increases, not available anymore; it should also serve those who had difficulties in using the non-dominant hand]. Very few persons know how to care for their razor and attributes; most barbers have excellent tools which they use wrongly. There is a critical minimum and maximum for the number of strokes on the hone or strop. The burr resulting from grinding where two planes reach each other, is necessary for wood treating tools, but is the enemy of fine edges. The original term 'affiler' means removing the burr.

2.01 Razor Hones And Their Different Qualities

Not all hones are suitable for honing razors. The Levant, the green hones from Spain, and those from Lorraine and the black ones from England, are too soft and have too large pores that create large, weak teeth on the edge that bend or break when touching the face. In addition, large teeth cut hairs at the top and tear at the base alternatively, causing pain. The only type suitable for the razor's edge are those called 'Pierres a Rasoirs', found in the caves around Liege. They are milk-colored or yellowish. The former are called Pierres de la Venette. The latter is the Old Rock. Marbled ones or those with veins are sometimes bad. In addition, small hard grains may be felt on bad stones, which destroy the edge. Hones should not be too hard (small, dense pores) nor too soft, but better too hard. Too soft makes rough, weak teeth; too hard only takes a few minutes more to hone. If a needle or your nail strikes the stone regular and without much resistance, it is hard enough. Olive or nut-oil should be used, or water. When a hone is too hard, water can enlarge the pores and make it softer; therefore water should not be used on softer stones, it may cause rough edges which must be corrected by stropping more times and with a little more pressure. Olive oil will clog the hone after seven to eight days causing the edge to slip. The hone must then be cleaned by rubbing with a small piece of a flat pumice stone under water, using the complete length of the hone, for about 10-20 times. The same procedure should be followed when the hone is used and irregular (hard and soft spots). If the hone is too soft, not pumice but another hone of the same type should be used to prevent damage. The surfaces of the rubbing stones should be completely flat and regular.

2.02 About The Razor's Edge And The Art Of Honing

The most difficult edge to create is that of the lancet, but that of the razor is also not easy to care for. For example, it suffices when a lancet is good and well sharpened to perform well at all type of operations, but a razor that works well with a heavy beard may not be effective for a normal one vv. Excellent razors exist that work well with both types, but this is not more than a compromise resulting from keeping the middle between a strong and a fine edge. It is the honing technique that makes an edge perfect for a specific type of beard. A relatively coarse and strong edge makes the hair fold instead of being cut; a too fine edge 'brakes off' or bends at thick hairs. Inappropriate edges cause hairs to be torn instead of being cut. So, one needs a fine edge for soft beards, and a coarser one for heavy beards.

There are some obstacles to over win in order to shave well. The razor does to a hair what a scythe does to grass but the scythe has the advantage that the top of grasses act as an effective counterweight, which the hair lacks. This imposes special problems on razor care, which are even more difficult to compensate than with the lancet. The lancet has a very soft edge, resulting solely from the technique of honing. It would be wrong to think that the same soft edge would be ideal for a razor: this is certainly not true, because a hair would pass under the edge and be torn instead of being cut. A razor's edge needs teeth, because its action is not to cut, nor to slash or hack, but to scythe. Therefore, the difficulty is in aligning those teeth perfectly. Also critical is the way the steel has been hardened, ground, steel quality. It may cause a razor to hold for two instead of thirty shaving procedures before honing is necessary again. A very good razor will behave as a bad one when honing is not done properly.

After grinding, the top of the edge where the two sides meet, is a thin and weak burr, that will bend away under the slightest pressure of e.g. a hair. It cannot cut - for that purpose, it is too weak. It is the task of the hone to remove the burr, not only of razors, but also many other tools. The blade is kept flat on the hone, and with the edge in the direction of movement, oblique strokes are made over the complete length of the hone. The pressure does not exceed the weight of the blade, or sometimes double the weight, but the last three to four strokes are only at the weight of the blade. At the end of the stroke, the tang is turned between index finger and thumb, and the next stroke is in the opposite direction, repeating this about twelve times for the fine razor, about twenty four times for the bigger razor.
To judge when you can stop honing, the edge should bite into the skin of the thumb when carefully rubbing it; if not, repeat honing for about four to five strokes (one stroke = back and forth). One should not give too many strokes, because then a burr forms again, which makes shaving bad. A coarse burr can be detected because it feels like a saw; a fine burr can be missed because sometimes you cannot feel it. In that case, you need a different test. This is done by make a cutting movement by letting the blade rest with it weight on your thumbnail. If the movement feels rough with obstacles, there was a burr; if it is smooth, there is no burr. You have to do the cutting movement on your nail twice, because the first time destabilizes any burr, the second time makes the burr fall aside, in such a way that giving 4 or 5 strokes on the hone restores the edge again. The edge is good when it bites into the thumb skin before as well as after having made the cutting movement on the nail twice. This is one of the most constant and consistent observations. If the razor is a bad one, this technique does not result in removing the burr. In that case, one should hone once with the back forwards and the back raised 1/12 inch - so only the edge rests on the hone; then turn the blade and give one stroke with the edge forward, and again the back raised 1/12 inch; this will result in the fall of the burr. Then give 5 or 6 normal strokes on the hone, back and forth (edge forward). In general, re-grinding on the wheel can de-harden the steel and should be avoided, and never done dry, but it may be necessary sometimes.

2.03 The Strop, How To Make It Yourself And How To Use It

[Comment: nowadays, cutting paste (red and green) is obsolete for use on hollow ground blades as it was used for the flat ground ones produced at earlier times. Also, leather glued on wood, used for the flat ground blades, is replaced by hanging strops suitable for hollow ground blades.] Even the best razor should be stropped every two or three shaves, especially when only one edge is used - both are used in the ambidexterity. The purpose of stropping is to restore the edge of which the teeth are misaligned due to shaving, and to polish the edge. In addition, long coarse teeth due to a too soft hone with large pores are made shorter by stropping. Thus, a strop can compensate somehow but not completely for wrong honing techniques or materials. The continuous rubbing of the edge on the skin causes rounding of the edge when of good quality, and bending when of poor quality.

Note: the following paragraph is only of historical importance, but does not apply to present razors

Good leather is calf, buffalo, or beaver. After gluing it on the wood, it is dressed with pumice (dry). Any substance put on the leather should be absolutely free of grains which might damage the edge. Many substances are used in powder form: stone, pencil, red chalk, hone, pumice, terracotta, and pottery. Pumice and pottery cut so fast that there is a risk of destroying the edge. Good substances are: amaril, le rouge d'Angleterre, vermillion or cinnabre. Rouge d'Angleterre is nothing more than cast iron (recipe in the book). The powder is mixed with olive oil or fat. The mixture should be hard and cold before applying it to the strop, then let it dry for two days [End of Note].
The blade is put flat on the strop, and the edge and back sides of the tang are between index finger and thumb. The blade is pulled over the strop diagonally, back into the direction of movement, so that the complete edge has touched the strop, then the tang is rotated in such a way that the blade flips over the back, then the process repeats 7 times. The edge is good when it bites the skin of the thumb; if not repeat 7 times (1 time = back and forth). The strop should be kept clean and free of dust that can damage the edge. The blade should be clean before stropping. Recommended natural leather is the palm of the hand, especially when covered with some pomade or oil, with the fingers stretched as far as possible backwards in order not to cause injuries. Some people have a strange experience: they shave until the razor refuses. They then let it rest 6 to eight weeks, strop 4 or five strokes, and are then able to shave again. The reason is seen under the microscope: rust forms in pores on the edge when it is wet; after a few weeks the rust particles drop off while stropping, reducing edge thickness; some more strokes create a new edge, and the razor is restored.

2.04 Hair

A microscopic study of hairs and Pain Resulting From Pulling On The Fifth Pair of Cranial Nerves; not relevant to the topic.

2.05 Soap

A hair cut dry looks like a piece of wood cut with an axe - irregular. One should use hot water, create a foam and apply lightly.

2.06 Shaving

One should have two razors stand by in case that one might refuse during the procedure, preventing the foam from drying out. Index finger and thumb are placed on the flanks of the tang; the middle finger on the plug connecting handle and tang, the ring finger on the handle, and the little finger on the other side of the handle (handle pointing upwards between middle and little finger). Very important is to keep the skin under tension. There are rules, described below, where and how to put your fingers and how to keep the razor, but it is necessary to experiment yourself and to find the best position both to shave and to keep the skin under tension. All movements should come from the wrist; the arm kept suspended somehow. One should keep the razor in the right hand, put your left arm over your head and put your fingers of the left hand just below the right ear, and stretch the skin. Put the razor under the fingers, the back not touching the skin, and shave in a few stroke to the jaw angle. Remember always that the point of maximal tension is just before the fingertips, so replace them with the razor in order to prevent injuries. Then put the fingers on the cheek and shave downwards to the jaw. Then proceed with the left side. If you want to use the left hand for that, take the razor in the left hand and stretch with the right hand as indicated above.

For beginners, ambidexterity is difficult; it is also possible to shave with the dominant hand only, as follows. After having shaved the right cheek, take the left hand to the left ear, keep the razor below it

with the right hand, and shave downwards to the jaw, repeating this in vertical downward strokes until you reach the corner of the mouth. For the moustache, take the nose tip upwards and stretch the upper lip by opening your mouth. Shave downwards, guiding the back by the nose; in that way, the razor rotates along its point-angle axis, which is called 'coup de maitre'. It implies cutting and rotating simultaneously on a stretched upper lip, thus preventing injuries. After having shaved under the nose tip, keep the tip aside and shave the lateral parts of the lip downwards. The chin is very difficult: put the left hand to the left cheek and under the left corner of the mouth and stretch well. Put the blade just before the fingers, and shave from left to right until the chin, making the movement of a scythe. Then replace the point of tension towards where you stopped shaving, somewhere left from the chin, then 'scythe' towards the other side of the chin. Instead of two strokes, you can use three or four, constantly replacing the point of tension to just before the edge, because you cut easily at this site. Then repeat on the right side with the razor again in the right hand. Finish at the chin, using the round point to prevent cutting the lower lip. This is not possible with a square point. The last part is the neck. Lift the head, stretch at the chin, shave from chin downwards, vertically. Then repeat this more laterally, shaving downwards, first left, then right. Here, also use scything movements. Then put your finger on the chin and shave upwards to the lower lip, using the finger as a guide for the back. No matter how good a razor is, there are two types of hair which resist this first shave: coiling hairs and hairs that grow in different directions. Therefore, a second shave against the grain is always necessary.

This procedure is different for every person; find the best grip and study the grain; sometimes it is necessary to shave horizontally from left to right. In general: the procedures of the first shave but then in the opposite direction. Some points are important: Stretch, keep the point of tension just before the edge at all times, and make a scything movement at points where this was indicated above. Scything means that the direction of cutting changes a little, and the whole edge is used successively during one cutting movement. Use the tongue to stretch the skin when necessary, or pinch the skin between fingers and then pull. Study carefully the direction of growth of the hairs at all places.

2.07 How To Shave With The Protected Razor (Rasoir A Rabot)

Not relevant anymore for present technique. Chapter 8, 9, and 10 - Non-razor topics. All types of hones for many instruments, where they come from, how to use them, microstructure, good and bad ones, a very interesting and detailed expose, but not relevant here. Also no new concepts that might be of importance for razors. Tips on how to let blood.

PART 3
Summary of 'The Razor' (1939)(ref 3)

3.00 Preface

The razor was originally made of bronze, later iron, and now precious steel. The form is not important for the result. When treated well, it has an almost unlimited life, and the cutting ability can last for years. It is the best tool to shave with; only the care for the edge requires some knowledge and skills, which can be learned easily. For the user, the only additional tool will be the strop. The new generation of shaving tools that arrived since the beginning of the 20th century were neither better, nor easier to use than the straight razor. However, the propaganda machine made people overlook the imperfections of the new inventions, and at the same time knowledge about how to use the straight razor was vanishing.

The next chapter is a detailed description about how to forge a razor, how to harden and pregrind it in its rough form, not further described here

3.01 The Hollow Grinding Procedure

In principle, it is not important which grade of hollow grind is used, as long as only the cutting edge and the back will touch the hone or strop. In theory, this would already be the case with a grinding wheel of 40 cm diameter, but this is not yet the perfect hollow grind; it is called a 'light' hollow grind or 'flat' grind. The disadvantage is, that in the hand of the layman, including the barber, this 'flat' hollow grind blade rapidly thickens in time after some years of honing. This blade would be dull soon, and could only be resharpened with coarse followed by fine hones; this would take a lot of time and the average user would spoil the blade. Another disadvantage is that these blades are very heavy. The full (1/1) hollow grind has the opposite effect in the hand of the expert or skilled layman: the edge becomes sharper (the razor gets 'settled'), easier to use, and the slight vibration of the edge caused by the wall increases its effect. Errors will be detected immediately, slight damages to the edge can be repaired easily, the razor is light and easy to use, and can be used for an unlimited period of time without regrinding on the wheel, and shaving is smooth and painless - provided that some rules of care are met.

One of those rules is the thickness of the back, which should be the blade width divided by 3,5. The hollow grinder divides the blade in two halves: the upper (towards the back) part is hollow, the lower (towards the edge) part is biconvex (the wall). The biconvex part consists of edge, thinning and wall; the biconcave part of 'soal', hollowing, back and stabilizing piece. The soal is the thin transition between wall and hollowing. The end result is a smooth transition between the parts, resulting in parallel shadows when keeping the blade in the light. The shadow moves when rotating the blade, and must keep its width at every place of the blade. During stropping or when rubbing the thumb over the edge, the 1/1 hollow grind blade gives a ringing sound (therefore the designation 'singing razors').

The form.
The point: square with sharp spike, half round with round spike, round with sharp spike, oblique with round spike. The spike is the transition between edge and point. The back: flat, half round, full round, decorated. The tang and stabilizing piece: flat tang with double or single stabilizing piece; half round tang with double stabilizing piece; flat tang with mirror, with or without stabilizing piece.

3.02 The Grinding Wheels

The Cutting Stone, diameter 110-120, 140-150, 170-180 mm for 3/8", 4/8", and 5/8" blades, respectively. *Function: creating the straight edge, a proportional correct back, with exact parallel running back-edges.*
The Pre-Grinder, diameter 75-80, 95-100, and 105-110 mm, respectively.
Function: to create the concave thinning of the blade between the wall and the edge, representing the 1/4 hollow grind phase.
The Post-Grinder, diameter 50-55, 60-65, 75-80 mm, respectively.
Function: to strengthen the edge and the thin part directly above it, and to create the wall which you can see in cross section.
The Hollow Grinder, 26-30; 32-35; 36-41 mm diameter, half round profile.
Function: to dig into the blade (the blade is put on the half round profile, in the length direction of the blade, about 2/3 next to the back.
RULE:
The position of the soal determines the grade of hollow grind (1/4, 1/2, 3/4 or 1/1, for positions directly above the edge to halfway towards the back, respectively - of course, between soal and edge there is always the wall). After using the cutting stone to create the edge, the edge is honed under a direction of 45 degrees, to strengthen the edge and prevent any further forming of burrs.

3.03 Honing

Grinding creates the rough form and correct cutting angles; honing provides the sharpness. An extremely thin edge will bend, not cut, therefore honing should also give some strength to the edge. The cutting angle is not the only important property; to cut the edge surface must be prepared correctly, which is also done while honing. Rule: hard on soft and soft on hard. We are searching for the best hone since centuries. There are many lubricants for hones, like oil, soap water, petroleum, but it is enough when you understand how to hone on a water stone. As a razor is hard, a soft hone is best, but this should not be a softness because of a coarse grain; it should be a natural dense surface with fine pores, so a combination of good cutting properties with finest grain/grit. The size of a hone should be 300 x 55 mm at least; the surface being completely flat and smooth and saturated with water. Strops should shine black metallic; this will take some months. They should be very smooth.

To hone, the tang is kept between index finger and thumb; the turning movement is done by rolling the tang between the fingers, without rotating the hand (excercise with a pencil). Edge in front, the back follows, edge and back on the hone, striking back and forth about seven times. The '45 degree edge' is gradually vanishing and a burr appears. Use very light pressure, slightly exceeding the weight of the blade. After that, the polishing of the edge starts, preferably with a yellowish waterstone. This total procedure costs about eight minutes.; testing is by detecting irregularities by the nail probe (cutting movement over the thumb nail). The strop serves to give an extra fine polish to the edge. Stropping is in the opposite direction compared with honing (edge first), flip over the back - never over the edge - and use only as much pressure needed to guarantee that back and edge are both touching the surface.

Hair Test: take a blond hair between thumb and index finger, and place the edge on the hair 3-4 cm above the thumb, do not move the blade aside (no slicing movement). It must be cut without bending, the cut part should not jump away. However, this is just a test; the ultimate test is shaving, which should proceed painless and without needing pressure of the hand. The pasted strop (green and red) is just a commercial object, and cannot be advised to the user or expert. The edge is so fine, it needs only honing once a year, and the rest can be done by stropping to polish the edge. Cutting pastes create new edges every time you strop. Coarse pastes cause a rough edge, which does not shave well. Painless shaving is impossible when the edge is not sharp. Only barbers who damage the edge by shaving many persons a day, need a good cutting paste or a hone to refresh the edge every day. Even then, the cutting pastes are originally meant for French knives, not for hollow ones. Hollow ones form burrs with cutting paste easily. In addition, many barbers stuck to the natural strop without cutting paste; the cutting paste

needs special skills and errors are occurring frequently. In addition, the back should be very close to the cheek to conserve the edge.

Frequently, customers only start to complain after the razor has been sent in for sharpening. The reason is, that before they shaved with a dull razor, increasing the shaving angle and the pressure, their pain nerves adapting to the pain. After sharpening, they damaged the edge by using the increased pressure and angle they got used to, or worse, by using cutting paste. A burr forms faster the sharper the blade is. The strop will be very smooth and shining, when the back and point of the blade are not too sharp. The hanging strop is best, because of its length, which should be used completely at every stroke. It should be kept under tension, however, carefully. It is better to have three or four razors you must use alternatively. Warming a cold blade in water can increase comfort. Many barbers have tried out several tricks with one purpose: to avoid honing. With the so-called cutting pastes one believed to have found a suitable method. However, more than ever barbers complain about bad cutting razors, causing them to try out many amateuristic experiments, such as glass plates, ashes, soap, oils, pastes etc, without any success. Even human skin was tried in the world war; imagine that our plants were using that experience seriously [Note: written in 1939]. Even after having used a pasted strop, the unpasted strop is necessary to complete the stropping process. Every barber who wants to use the cutting pasted strop, should have experience with honing first, for 10-15 years. Then which strop should we use? The best strop is not treated with anything, and serves to 'iron' the edge, make it dry, and somehow clean it. The edge, which microscopically consists of many little parallel steel wires, is misaligned by shaving, which is restored by stropping. The surface should better not be fat, because it invites you to use too much pressure. The unprepared smooth strop is better for the fine motor movements of the hand. The leather should not get rough. When you have more experience with the natural , unprepared, smooth strop, a fatty strop can improve the results - can! In addition, unprepared, smooth strops can be made a little sticky by putting some fatty paste or cream on it. The other side of the strop is made of some rough fibers, mostly hemp. This side, too, should be shining like a mirror. They serve to strop a few times before using the leather side. The hemp side also unprepared, or using some fat - no cutting pastes [Note: white contains chalk and is cutting; the only non-cutting paste is the yellow one, or olive oil].

Conclusion

As far as I know, based on searches from many libraries, there is no more literature on the technical part of the subject than referred to in this FAQ. Any suggestions for further reading are therefore very welcome, as well as experience and better knowledge. The website will contain schemes and pictures as well.

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