

# Dress for Success In Snow



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When you are at a ski resort or mountain cabin with your family, you can play outside in the snow, and when you get too wet or too cold, you can come inside, change your wet clothes and warm up by the heater or fire. In cold weather

camping, there is no inside other than the inside of your tent or snow cave. You have a limited number of changes of clothes, and taking off wet clothes in the tent has a tendency to get everything else wet. At night, the wet clothes you took off will freeze, making them that much more difficult to deal with.

## **In Wilderness, It Is Far Easier To Stay Warm To Begin With, Then To Try To Get Yourself Warm Again After Becoming Cold**

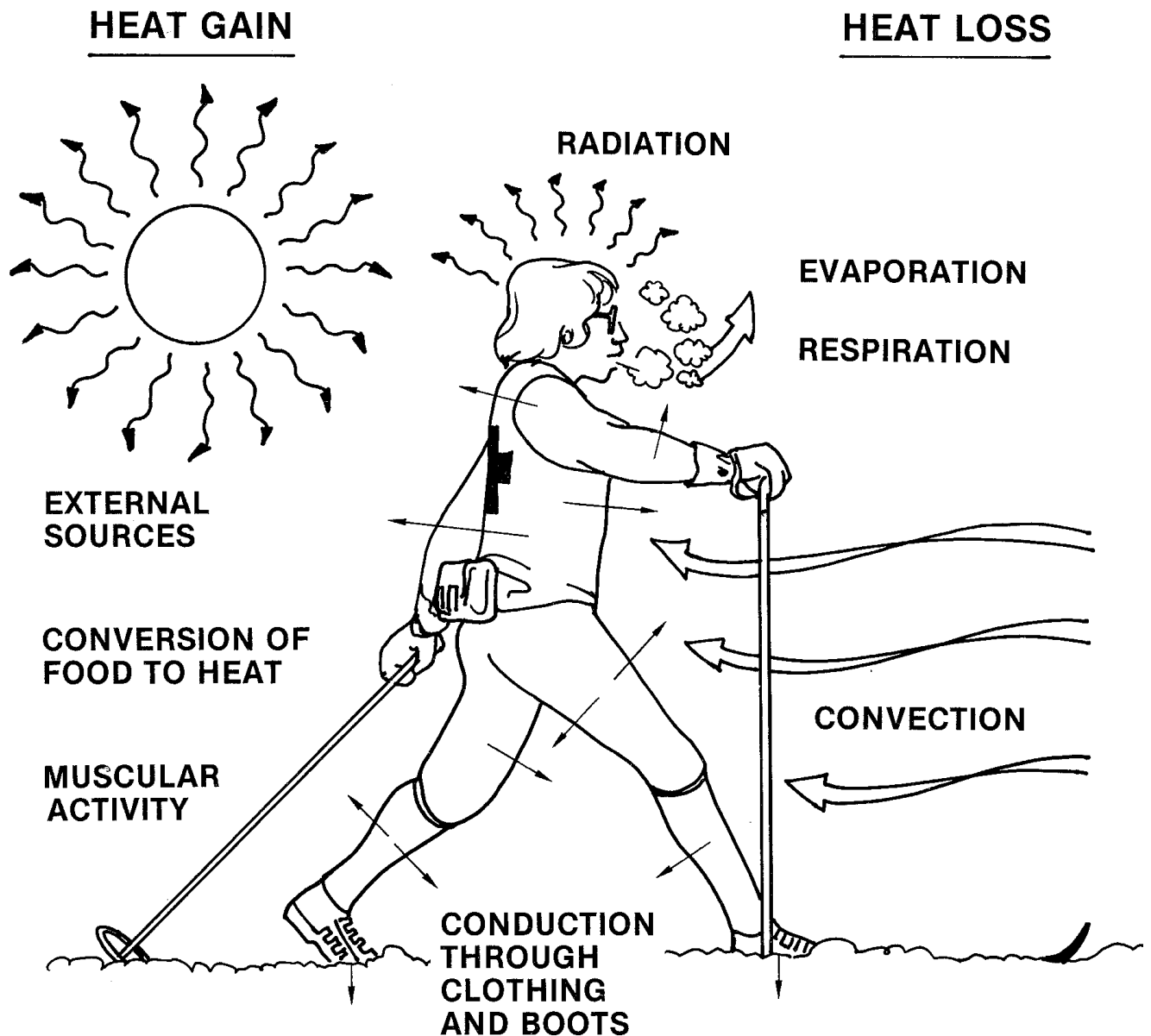
### **Conserve Body Heat**

The goal in cold weather camping, then, is not to keep cold out; it is to keep your own body heat in.



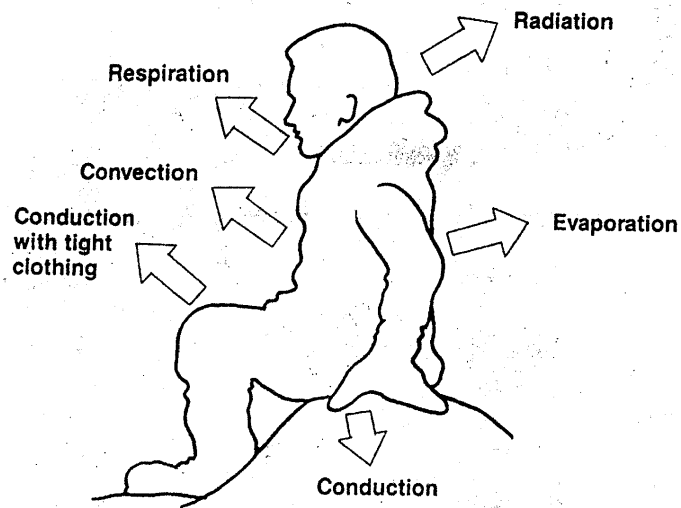
### **Maintain Thermal Equilibrium**

The goal also is not to make yourself as warm as possible; rather it is to maintain “thermal equilibrium.” You do not want to become too cold, nor do you want to become too hot, overheat, and begin to perspire. Perspiring will cause your clothing to absorb moisture, which helps it conduct heat away from your body faster, and the process of perspiration evaporating also lowers your body temperature. This will make you too cold later when you become less active and the outside temperatures begin to drop once the sun goes down.

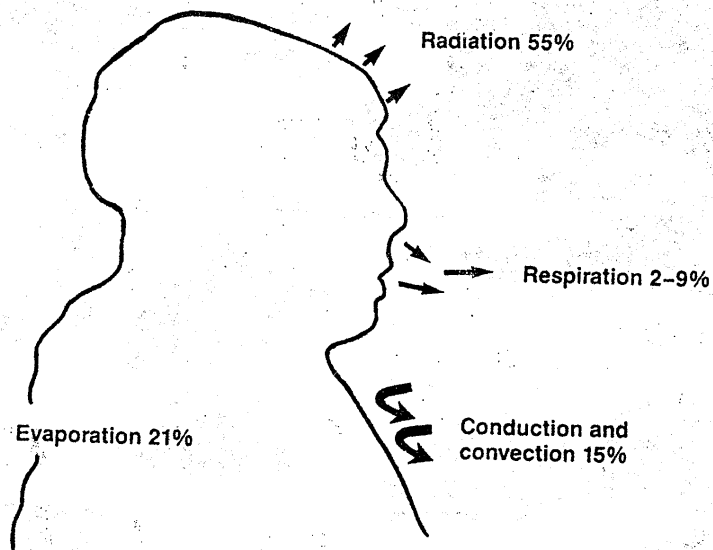


### **Protect the Head and Trunk (the Body Core)**

While we do not want to leave any area unprotected, we are especially concerned with protecting the head and trunk. When the body core is warm, blood circulates out to the extremities much better, warming them too. If the core is cool, it is very difficult to warm it externally short of immersion in a hot bath. Keeping the core warm with dry, insulating clothing, warm, high-energy foods and liquids, and a combination of exercising with adequate rest works best.



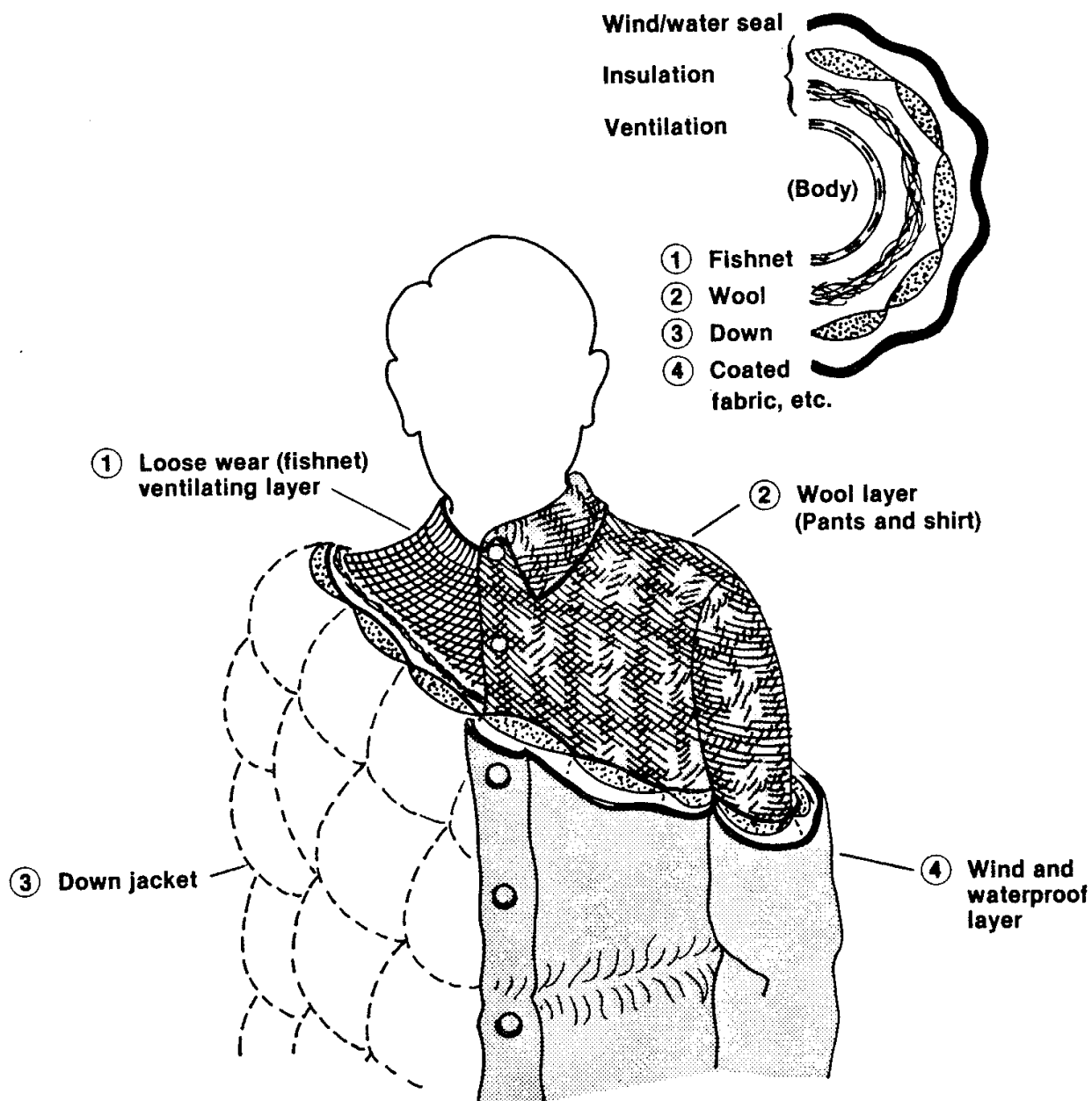
**Types of Body Heat Loss**



**Types and Possible Percentages of Upper-Body Heat Loss**

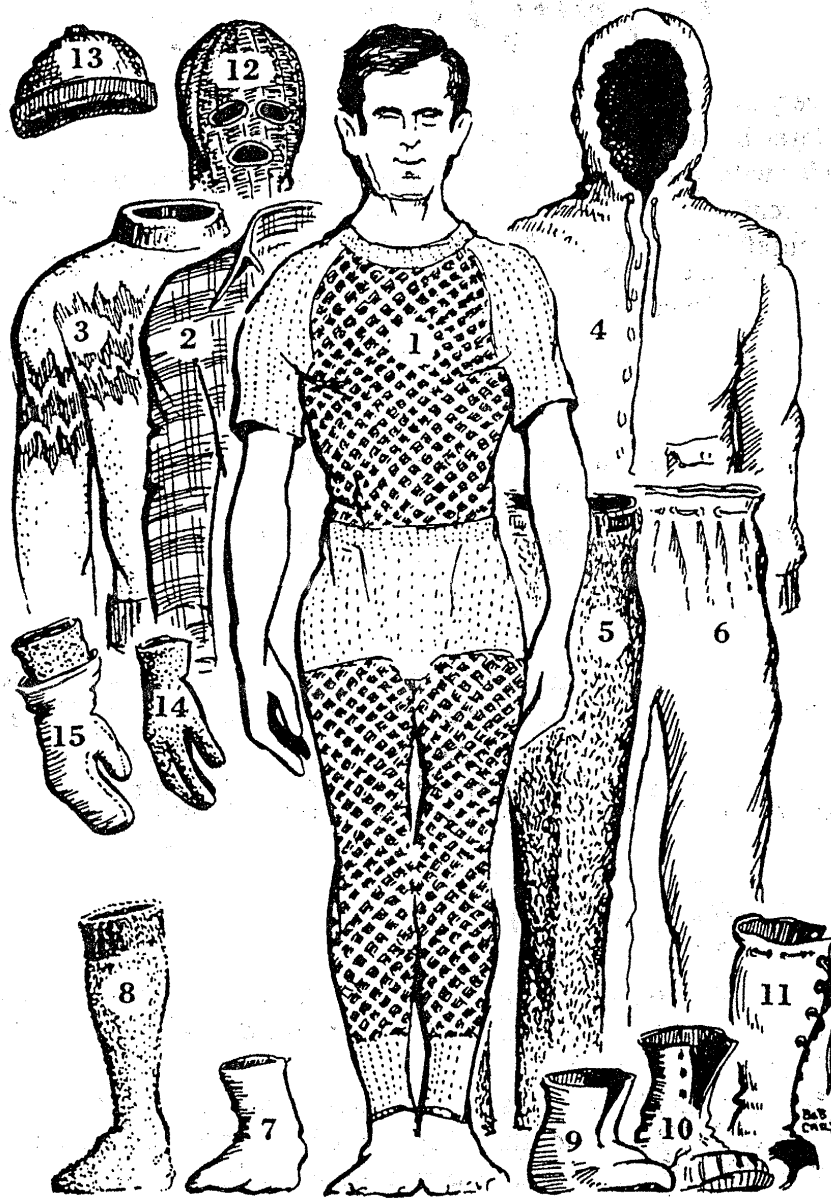
### **Strive for Versatility**

Your wardrobe should be versatile, allowing you to adjust it and adapt it to a variety of conditions over the course of the day and night.



## Layering

The best way to achieve this versatility is through the use of layers of clothing.



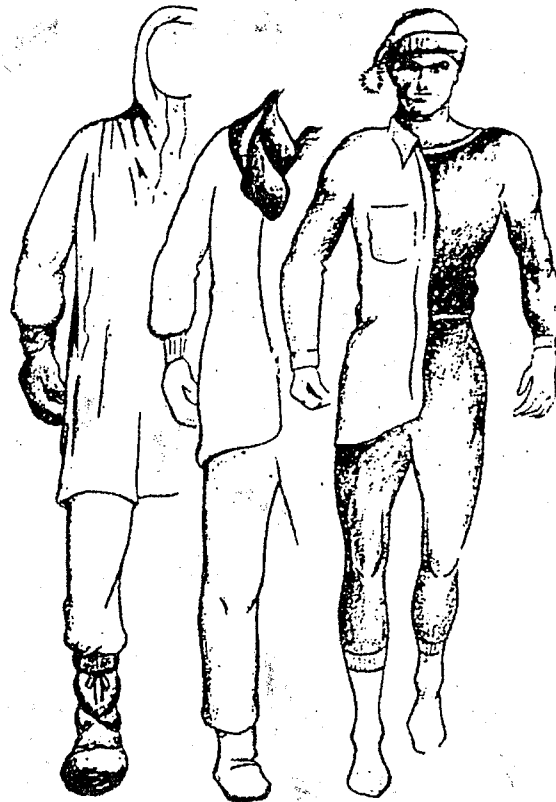
### Types and Amounts of Clothing

1. long underwear; 2. shirt or inner layer; 3. sweater or light jacket; 4. wind or rain gear; 5. inner pants; 6. wind or rain pants; 7. wicker inner socks; 8. insulating socks; 9. boot liners; 10. and 11. footwear; 12. and 13. head coverings; 14. and 15. gloves and mittens

Layers include:

- Long underwear – ideally made of polyester, polypropylene, wool-poly blend, silk, or a wool-cotton blend (not the best)

- Insulating layer – synthetic fiber pile, wool, or wool blend is best
- Outer shell – Gore-tex and it's clones are best, as they allow water vapor to escape, while keeping rain and melted snow out. This should be a wind breaker/water repellent layer with a hood.
- Rain suit or poncho - to keep out heavy snow and rain
- Accessories – sunglasses or ski goggles, wool or polyester “beanie”, or balaclava (covers face too, with opening for eyes, nose and mouth), polyester glove liners and insulated gloves with water repellent shell, polyester sock liners with polyester-nylon-wool blend insulated socks, rubberized, insulated leather boots, or rubber galoshes.



A Proper System of Layering

## Synthetics

Synthetic materials, such as polypropylene and polyester have a very low water absorption factor. Polypropylene, for example, absorbs less than .1% of its

weight in water. Instead, it wicks moisture away from your body to the outer layers, where it is either absorbed or wicked still further, depending on the make-up of that material. This is important, because we lose body heat much more rapidly through water than we do through air.

### **Fiber Piles**

Fiber pile is mostly polyester. Polyester is a very stiff, springy fiber that holds its loft for trapping air. Pile begins as a thin, dense cloth which is then passed through napping machines until a thick pile, commonly called fleece, is achieved. Polyester wicks almost as efficiently as polypropylene. You can dip it in water, wring it out, and it will still retain its loft and keep you reasonably warm. Pile clothing is generally rates as 100 (light), 200 (medium), and 300 (heavy weight).

### **Wool**

Wool and wool blends absorb moisture, but they also retain much of their loft and therefore insulating ability when wet.

### **Cotton**

Cotton is probably the least desirable material for winter camping/snow play, because it absorbs water readily and when wet loses virtually all of its insulating ability.

### **Down**

Down is a very good insulator as long as it is dry. It maintains greater loft for a given weight than any other materials, as long as it is dry. It mats down when wet, however, and loses almost all of its insulating ability.

### **Gore-tex**

Gore-tex, along with a few recent clones, is essentially a thin, flexible Teflon membrane laminated between two layers of nylon cloth. This membrane contains 9 billion pores per square inch. Each pore is 20,000 times smaller than a drop of water, but 200 times larger than a molecule of water. It can still leak, especially in driving rains, and it needs to be close to the skin so that it does not get too cool and condense the water vapor moving up from the body and trap moisture inside the shell.

# Clothing—the Key to Comfort

**Headgear.** This is a matter of personal preference, but it always a good idea to have at least one stocking cap or knit cap for use under a parka hood or in the sleeping bag. Soft, insulated caps with ear flaps are good, but should be loose fitting.

**Eye Protection.** Goggles are best, but sunglasses and homemade snow shields will reduce glare from sun off the snow, a situation that can cause painful problems, and even "snow blindness."

**Scarf.** Wool or synthetic fiber makes an excellent cold weather protector, but make sure the scarf is plenty long.

**Parka.** The *amorak* or pullover parka should be windproof, should reach almost to the knees, and be large enough to fit over all the other garments. It should have a hood.

**Hand Covering.** This is a matter of personal preference that can be made up of any loose fitting combination of the following: wool gloves, wristlets, wool mittens, foam mittens, Dacron mittens, leather overmitts, or wind and waterproof expedition mitts.

**Jacket.** A lightweight jacket used in combination with other outer garments makes a better "layering" system than one thick, heavy jacket. A hood for extreme cold is a welcome addition.

**Vest.** This insulated garment keeps the vital organs, heart, and lungs warm. The best style has a flap in back to protect the kidneys. Detachable sleeves convert a vest to an insulated jacket.

**Sweater.** Wool or wool synthetic sweaters will keep you warmer.

**Shirts.** Wear full-cut, loose wool or wool and synthetic fiber.

**Long Underwear.** This can be wool, wool and cotton, wool and synthetic fiber, or synthetic fiber. Keep a spare set for emergencies and to sleep in.

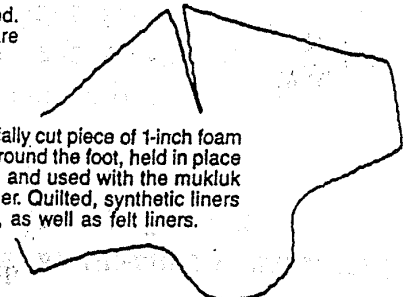
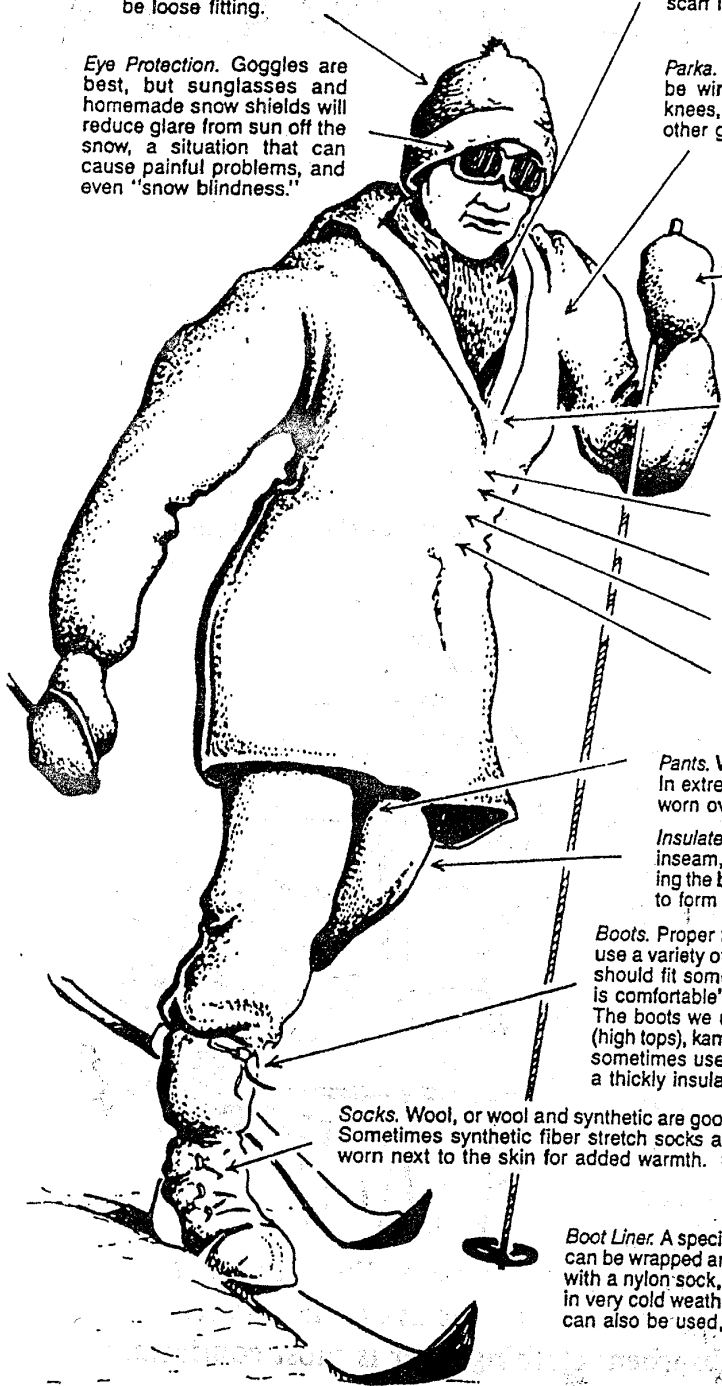
**Pants.** Wear full-cut pants, preferably with suspenders. In extreme cold, lightweight, windproof pants may be worn over everything.

**Insulated Chaps.** Equipped with snaps down the inseam, they may be put on or taken off without removing the boots. Taken off, the legs may be zipped together to form a half bag inside the sleeping bag.

**Boots.** Proper footgear is essential. In the Okpik program we use a variety of footgear, designed for different needs. A boot should fit somewhat loose for warmth, but the adage "cool is comfortable" is true; the feet should not sweat profusely. The boots we use are rubber, rubber bottom pacs, mukluks (high tops), kamicks (low boots), moccasins, and ski boots. We sometimes use a combination of a light boot for travel, and a thickly insulated boot for camp.

**Socks.** Wool, or wool and synthetic are good. Sometimes synthetic fiber stretch socks are worn next to the skin for added warmth.

**Boot Liner.** A specially cut piece of 1-inch foam can be wrapped around the foot, held in place with a nylon sock, and used with the mukluk in very cold weather. Quilted, synthetic liners can also be used, as well as felt liners.



## **Dressing for Snow, The Ideal**

There are many factors to consider, of course, but an ideal outfit, allowing maximum versatility, light weight, freedom of movement, and maximum wicking and insulating benefits, might include:

- Polyester long underwear with half-turtle neck
- 200 rated polyester pile pants
- 200 rated polyester pile jacket
- Gore-tex parka or Gore-tex insulated parka with hood
- Gore-tex shell pants or insulated pants
- Polyester pile face mask
- Knit wool cap, or polyester fleece cap
- Sunglasses or ski goggles
- Polyester glove liners
- Gore-tex outer gloves
- Polyester sock liners
- Plastic baggie thermal barrier for feet
- Polyester/wool/nylon trekker or ski socks
- Rubber coated leather boots, or rubber galoshes

## **Realistically**

That's the ideal, but it can be fairly expensive, though prices have come down for a lot of these products in recent years.

As a practical matter, we might have to improvise, budgets being what they are. Also, see the Boy Scout Field Book, Okpik and Venture Crew Manual for Winter Camping for suggestions for making foam and nylon clothing inexpensively.

Here are some alternative suggestions:

Long underwear; any will do (synthetics or wool-blend are the best). Avoid cotton (buy at Mel Cotton's, REI, Stevens Creek Surplus, Western Mountaineering, or any sporting goods store).

Trousers – ideally wool, or wool blend. Army surplus work very well and are cheap (Mel Cotton's, REI, Stevens Creek Surplus). Wool dress slacks can work (try Goodwill). Avoid jeans, they are made of cotton, absorb water, and do not insulate.

Turtlenecks – again, synthetics or wool-blends are better. Any clothing store.

Wool Shirt or Sweater – medium weight, or wool, or synthetic. Any clothing store.

Medium to Heavy Sweater – wool or synthetic. Any clothing store.

Heavy Jacket or Parka – water repellent, or spray with water proofing.  
Any clothing store.

Outer Shell Trousers – nylon shell, skiers pants, or rain pants. Any ski shop, Mel Cottons, REI, Stevens Creek Surplus, or rent at the Ski Renter.

Poncho or Rain Jacket and Rain Pants – any clothing store, Mel Cotton's, REI, Stevens Creek Surplus, Western Mountaineering.

## **Accessories**

And top this list off with:

Polypropylene Inner Socks – Mel Cottons, REI, Stevens Creek Surplus

Polypro/Wool/Nylon Blend Outer Socks – Mel Cottons, REI, Stevens Creek Surplus

Heavy Leather Boots with Sno-seal, or Rubber Coated Bottoms, Mukluks, or “Moon Boots” (foam insulated nylon boots with rubber bottoms – commonly called “after ski boots” – Mel Cottons, REI, Stevens Creek Surplus, or rent at the Ski Renter.

Polypropylene Inner Gloves – Mel Cottons, REI, Stevens Creek Surplus,

Insulated Nylon or Leather Outer Gloves – Mel Cottons, REI, Stevens Creek Surplus, Ski Renter

Polypropylene Pile Neck Gaiter, or Soft Wool Scarf (long) – Mel Cottons, REI, Stevens Creek Surplus, Ski Renter

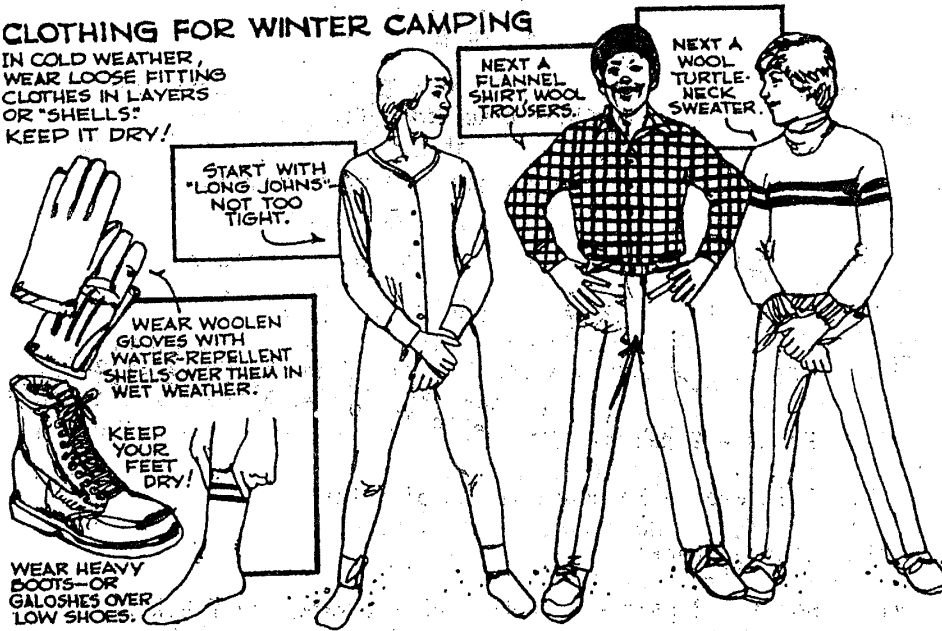
Sunglasses or Goggles (preferably both) – Mel Cottons, REI, Stevens Creek Surplus, Ski Renter

Polypropylene Pile Beanie or Cap, or Wool Cap – Mel Cottons, REI, Stevens Creek Surplus, Ski Renter

Polypropylene inner socks are inexpensive and sold at most outdoor shops and Scout Shops. Sno-seal and silicon spray for waterproofing clothes are sold in most outdoor shops and many hardware stores. Inexpensive gloves and hats can be purchased at surplus stores and hardware stores.

## CLOTHING FOR WINTER CAMPING

IN COLD WEATHER, WEAR LOOSE FITTING CLOTHES IN LAYERS OR "SHELLS". KEEP IT DRY!



START WITH "LONG JOHNS" - NOT TOO TIGHT.

NEXT A FLANNEL SHIRT WOOL TROUSERS.

NEXT A WOOL TURTLE-NECK SWEATER.

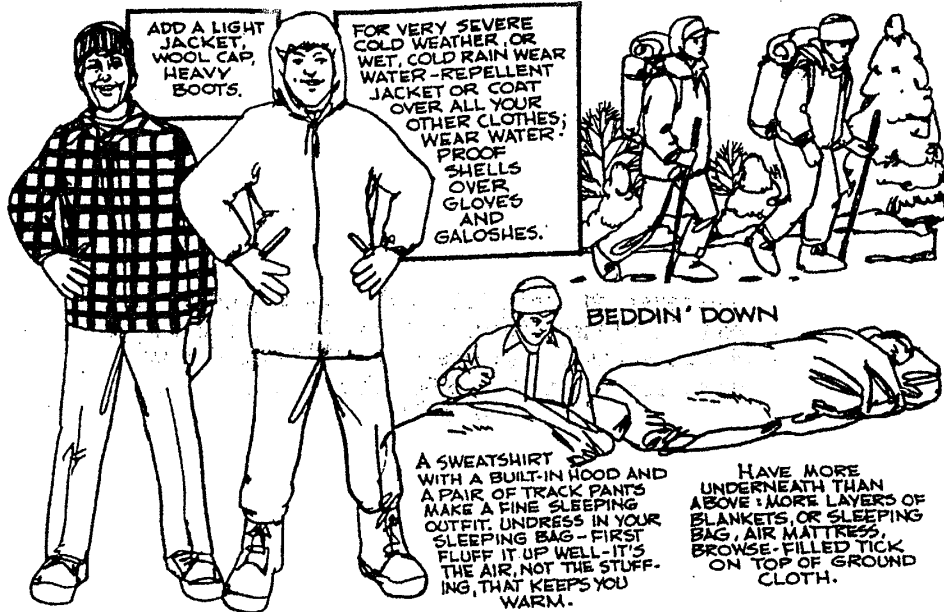


WEAR WOOLEN GLOVES WITH WATER-REPELLENT SHELLS OVER THEM IN WET WEATHER.



KEEP YOUR FEET DRY!

WEAR HEAVY BOOTS - OR GALOSHES OVER LOW SHOES.



ADD A LIGHT JACKET, WOOL CAP, HEAVY BOOTS.

FOR VERY SEVERE COLD WEATHER, OR WET, COLD RAIN WEAR WATER-REPELLENT JACKET OR COAT OVER ALL YOUR OTHER CLOTHES; WEAR WATER-PROOF SHELLS OVER GLOVES AND GALOSHES.

### BEDDIN' DOWN

A SWEATSHIRT WITH A BUILT-IN HOOD AND A PAIR OF TRACK PANTS MAKE A FINE SLEEPING OUTFIT. UNDRESS IN YOUR SLEEPING BAG - FIRST FLUFF IT UP WELL - IT'S THE AIR, NOT THE STUFFING, THAT KEEPS YOU WARM.

HAVE MORE UNDERNEATH THAN ABOVE: MORE LAYERS OF BLANKETS, OR SLEEPING BAG, AIR MATTRESS, BROWSE-FILLED TICK ON TOP OF GROUND CLOTH.

## More On Cotton and Wool

Even people who live in snow country do wear cottons and wools. But they avoid getting wet, and if they do get wet, they go inside, dry off, and change. The more the wardrobe contains cottons, and even wools to a lesser extent, the more the Scout needs to be aware that he can't allow himself to get wet. If he does, he needs to have a full set of clothes to change into.

Generally, on a two-day trip, try to be careful on the first day. On the second day, you can be more relaxed, as you are going to be getting into a warm care and head home shortly. Save the big snow fight for the last day!

## Thermal Barriers and Plastic Bags

A note on thermal barriers. Putting a plastic bag between your inner sock or inner glove and your outer sock or glove creates a waterproof "thermal" or heat barrier between your skin and the cold, wet snow. The inner sock or glove wicks moisture away from your skin so you don't get to "clammy", but stay relatively dry and comfortable. The plastic barrier keeps snow melt away from your skin and holds in body heat. The outer sock or glove insulates and protects the plastic thermal barrier.

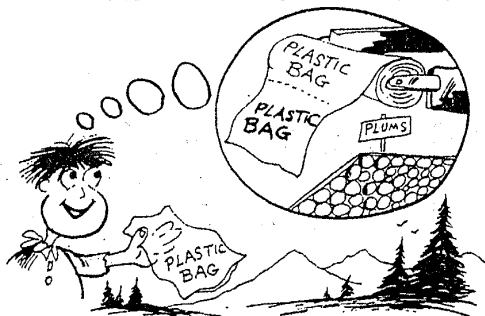
Plastic bags also are handy for making impromptu waterproof skirts (OK, kilts if you are a guy), leggings (one bag over each leg), waterproof vests (just cut a slot in the top of a large garbage bag for your head, and slots on each side for your arms, and waterproof hats (or waterproof covers for your hats). Always bring half a dozen or so large, heavy-duty trash bags (30 gallon) with you when winter camping (at least three for summer camping – you never know when it is going to rain!).

**Remember, you lose about one-third of your body heat through your head. As your body temperature begins to cool, your body slows down the circulation of blood to your extremities in order to keep the body core warm. So, if your hands and feet are cold, put on a hat!**

**It's the same at night. Wear a wool or fleece cap or beanie to bed. Keep your head warm, but don't put your face inside the sleeping bag. Your respiration is full of moisture, which will collect and condense inside the bag, making you colder.**

**Do not wear cotton clothing to bed. It will absorb moisture from your body, causing you to become colder.**

DOOLEY REMEMBERED TO SAVE SOME **PLASTIC BAGS** FROM THE GROCERY STORE'S FRUIT AND VEGETABLE DEPARTMENT.



**KIDS! KEEP ALL PLASTIC BAGS AWAY FROM YOUR NOSE AND MOUTH AND FROM THE LITTLE KIDS, THEY ARE NOT FOR PLAY—BUT THEY CAN SAVE YOUR LIFE!**

DOOLEY ALSO THOUGHT TO BRING A LARGE (39 GALLON SIZE) PLASTIC TRASH BAGS. HE THEN CUTS 3 HOLES IN ONE FOR HIS HEAD AND ARMS TO FIT THRU.

HE TAKES THE NEXT 2 BAGS AND HE WRAPS HIS LEGS WITH THEM AND THEN HE TIES THEM WITH SOME STRING.

THEN DOOLEY PUTS HIS CLOTHES ON OVER ALL THE PLASTIC BAGS. NOW DOOLEY CUTS 3 HOLES IN THE LAST BAG TO PUT HIS HEAD AND ARMS THRU, AND HE PUTS IT ON OVER HIS CLOTHES FOR WHEN IT RAINS OR SNOWS. PLASTIC BAGS ARE ONE OF THE BEST WAYS TO HOLD IN YOUR BODY HEAT FAST AND KEEP YOU WARM AND DRY WHEN IT GETS COLD.



TO KEEP HIS FEET WARM AND DRY, DOOLEY PUTS A PLASTIC BAG OVER EACH BARE FOOT,



THEN HE PUTS ON HIS SOCKS,



THEN HE PUTS ON ANOTHER PLASTIC BAG OVER EACH SOCK,

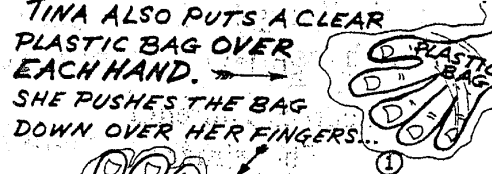


THEN DOOLEY PUTS ON HIS BOOTS OR SHOES.

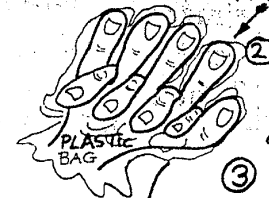
NOW DOOLEY'S FEET ARE WARM AND SAFE FROM WATER. WET FEET IN SNOW COULD MEAN FROSTBITE!



TINA ALSO PUTS A CLEAR PLASTIC BAG OVER EACH HAND. SHE PUSHES THE BAG DOWN OVER HER FINGERS.



THEN TINA PUTS ON HER GLOVES OR MITTENS.



NOW TINA'S HANDS ARE SAFE FROM SNOW OR WATER. THE PLASTIC BAG SEALS IN HER BODY HEAT—LIKE SEALS IN FOR THE ESKIMO PEOPLE.

SAVE THE SEALS!

