DEPARTMENT OF THE AIR FORCE
71st AEROSPACE RESCUE AND RECOVERY SQUADRON (MAC)
APO SEATTLE 98742

REPLY TO ATTN OF: DOPJ/752-4888

5 MAR 1976

SUBJECT: 1976 ARRS Mt McKinley Expedition

TO: 71ARRS/CC
ARRS/SG
IN TURN

1. Military rescue capabilities in mountainous terrain at altitudes above 14,000 feet are virtually non-existent. The steady increase of human activities at high altitude entails the occurence of accidents by increasing numbers. Aircraft incidents at high elevations are a reality to predict. The need for organized rescue to be mobilized on short notice becomes an obvious requirement. East-block nations have established such capabilities; it must be obvious to them to realize its military value. The USA should not lag behind.

2. A high-altitude rescue plan must be developed. It must include selection criteria for suitable personnel, equipment and training requirements, appoint responsible ARRS units, and a directive sequence of required actions to mobilize and effect high-altitude rescue operation.

3. Prior to the compiling of such plan, knowledge and experience must be gained as a foundation to sound and efficient high-altitude rescue capabilities. Motivation and dedication to such undertaking is also a factor which is of prime importance to assure success. Essential knowledge of high-altitude mountaineering procedures, its hazards and its various aspects, is available through numerous individual and scientific reports and studies. This is tremendously helpful in planning high-altitude rescue operations. However, actual experiences of organized rescue activities are underdeveloped and unsatisfactory in documentation. Experienced mountaineers and expeditioneers reflect in numerous reports the need for organized high-altitude rescue teams, but recognize the difficulty of organizing such teams due to the widespread locations of individuals and the logistic problems involved.

4. Consequently, the experience gained by pararescuemen in the proposed Mount McKinley Expedition closes the gap and provides essential data for compiling a workable high-altitude rescue plan. The benefit of first-hand experience is not only to collect valuable data on procedures, equipment, and environmental considerations, but also establish factors of team limitations, the recognition of symptoms and signs of high-altitude sicknesses, travel and acclimatization problems, and personal limitations.

5. I urge the approval of the proposed expedition.

Udo C.J. Fischer

UDO C.J. FISCHER, SMSgt, USAF
NCOIC, Pararescue Section

1 Atch
SSgt LaPointe's Plan and all atchs

DEPARTMENT OF THE AIR FORCE
71st AEROSPACE RESCUE AND RECOVERY SQUADRON (MAC)
APO SEATTLE 98742

REPLY TO ATTN OF: DOPJ (SSgt Robert L. LaPointe, 752-4888)

4 MAR 1976

SUBJECT: 1976 ARRS Mt. McKinley Expedition

TO: 71 ARRS/CC
HQ, ARRS/SG
IN TURN

1. Enclosed is a plan for the proposed 1976 ARRS Team to ascend Mt. McKinley. It will be noted that this plan is of a smaller scale than that submitted by MSgt Robert Watkins of the 303rd ARRS. The purpose of a smaller team is to allow easier coordination between team members before the climb and better command and control of the team while on the mountain. While the loss of MSgt Watkins presence during this climb is regretable, it should not be construed that his participation was essential to the safe completion of this project. We have within the pararescue force other individuals who have the necessary knowledge, experience, and mountaineering background to safely and successfully carry through this proposed project.

2. The objectives of this expedition whould be as follows:

a. Climb to the top of Mt. McKinley (20,320') if it is safe to do so. At any time that safety is compromised (i.e. bad weather, trouble acclimating, etc.) we will back off and regroup until it is safe to continue. Everyone on this team will understand that our primary responsibility is to ensure that each of us return safely from this project.

b. Sub-arctic living in an extreme cold weather environment.

c. Glacial travel and mountain cross country navigation.

d. Construction of snow shelters.

e. Testing of pararescue equipment in extreme temperatures:

(1) Clothing

(2) Equipment

f. Use of climbing gear on varying terrain (e.g. ropes, screws, pickets, jumars, etc.)

g. The begining formation of a group of ARRS climbers who have climbed together as a team using standard pararescue equipment for the purpose of forming the nucleus of a high altitude SAR team.

h. Upon completion of this exercise, the compiling of a report on a high altitude operation giving future recommendations on team compositions and equipment.

3. The approval of this project would have the following beneficial effects on the mission of ARRS.

a. The primary benefit of this trip would be that a nucleus of active duty supervisory personnel within the pararescue field would have had experience working together on a high-altitude mission using equipment off the shelf from their sections. This would allow ARRS HQ to have a resource to use to organize any future high-altitude SAR missions. These individuals could be used in the future to train other Pararescuemen in high-altitude operations.

b. This ascent would be the first time that an all USAF team climbed to the summit. The resulting publicity of this climb during our bicentennial celebration could be most favorable.

c. Also not to be overlooked would be the effect that this sort of project would have on the morale of the pararescue force. There are many within the field who believe that the days of an elite pararescue force, capable of completing unusual and difficult tasks, is slowly eroding. The approval of this sort of project would add credibility and pride to the entire career field.

Robert L. LaPointe

ROBERT L. LAPOINTE, SSgt, USAF
Pararescueman

9 Atch
1. Equipment Listing
2. Menu Listing
3. National Park Service's Application to Climb
4. National Park Service's Physician Certificate
5. State of Alaska Bicentennial Commission Letter
6. National Park Service Mountaineering Environmental Ethics
7. Medical Problems
8. High Altitude Medical Kit
9. Sgt LaPointe's Trip Report

Plan For The 1976 ARRS Bicentennial Ascent Of Mt. McKinley

Compiled By: SSgt Robert L. LaPointe

DATE OF CLIMB: 17 May thru 14 June 1976

These dates were selected due to the condition of the snow on the lower sections of our route during this time frame. During this period, the snow is still deep and firm. Most crevasses are filled with snow on the lower sections of the route and therefore pose a much less serious problem during travel on the glacier. Historically speaking, climbers have found this time of the year to be the most suited for easy travel on the mountain.

AMOUNT OF TIME NECESSARY TO COMPLETE THE ASCENT - 20 to 30 days

The exact number of days that it will take us to complete this project is impossible to predict. However, after intensive research from post-climb reports filed by past climbers (located at Mt. McKinley National Park) and discussion with the climbing rangers at the park, it has been concluded that the majority of teams complete the climb in approximately 20 days. The determining factor which could increase the time is, of course, the weather.

PERSONNEL: 8 Pararescuemen

The team composition will be made up of eight pararescuemen. The purpose for selecting this number of individuals is that it provides mobility and the ability to effect a self-rescue in the event that anyone were to become ill or injured. These individuals will come from the following locations and the names given are those of potential climbers.

71st ARRS, Elmendorf AFB, Alaska (Will provide two PJ's)
SSgt Robert L. LaPointe
SSgt Dennis Williamson
Pararescue School, Kirkland AFB, New Mexico (Will provide two PJ's)
MSgt Dennis Kraft
TSgt James Holloway
Air National Guard, Hayward AFB, Calif. (Will provide two PJ's)
TSgt Richard Grady
Another individual yet to be determined
41st ARRW, McClellan AFB, Calif. (Will have a slot for 1 PJ)
TSgt Terry Wetzel

In addition, the Pararescue Section at McClellan would be given 2 slots if they were able to fill them. Prior communication with this unit has indicated that they are interested but unsure if they can get permission from their commander to participate in this project. They are more or less waiting for developements from HQ to see if this project is approved.

LEADERSHIP

The leader of the climb will be the ranking man of the team. It should be emphasized that the leaders job will be to make the final decisions based on information provided to him from other team members. Of the team members listed above, TSgt Holloway, SSgt LaPointe, and SSgt Williamson all have a great deal of knowledge with the area due to their assignment close to the mountain. SSgt LaPointe has also led two low reconnaissances of the mountain: one in June 1975 on the Muldrow Glacier Route to 7000' and one on the West Buttress Route to 14,300' in February 1976. SSgt Williamson was also a team member on both of these successful trips.

ROUTE: (See Enclosed Map)

The route up and down the mountain will be on the standard West Buttress Route. The landing zone and Camp 1 are located at the 6500' level on the main Kahiltna Glacier. Camp 1 is usually located at the X in the S. E. fork of the Kahiltna Glacier. In this terrain, small fixed wing aircraft must land uphill and take off downhill. As a matter for your information, this is the point where the 71st ARRS winter team was dropped off. We will be able to skip this usual Camp 1 and go directly to our Camp 1 due to the fact that we will be landing in a helicopter. The reason that these spots are the usual Camp 1 is because they are outside the boundary of McKinley National Park. No aircraft are allowed to land or make air drops within the National Park except under emergency situations. Camp 2 is located at the 7300' level of the Kahiltna Glacier, Camp 3 at 8000', Camp 4 10,000' Camp 5 11,000', Camp 6 12,500', Camp 7 14,300', Camp 8 17,200, and from this 17,200' camp the trek to the summit and back is made.

ALTERNATE ROUTES:

No alternate route will be used. This route is the easiest on the mountain and is very straight forward. In the event of any problems during the ascent, we would descend the exact same way we went up. In the unlikely event that we require assistance by a rescue party, they would know exactly where we were and they would be able to find our wands. (A wand is a 3' bamboo pole with a flag on the top. They are placed every 160' so as not to get lost on the route and to make route finding during descent easier.)

BACK-UP RESCUE:

In the event that anyone became injured, rescue would primarily be a self-rescue effected by the other members of the team. Anyone injured above 14,300' must be lowered by personnel on scene to that altitude. 14,300' is the highest that ARMY helicopters are able to safely land on the mountain. Any lowering of personnel to 14,300' is usually done by other members of the party due to the fact that it normally takes a ground mountain rescue team almost ten days to reach 17,200 to assist you. They have to land at low altitude and climb up to rather slowly in order for their bodies to acclimatize. Another source of rescue assistance while climbing is other teams already on the mountain. It is common practice for all parties that are going to be climbing at the same period of time to effect a reciprocal rescue aggressment. The terms of these agreements are that if one team

requires assistance, the other team will help. During the time frame that we wish to climb, there will be three other parties on the mountain. Upon approval of this plan, we will contact these parties and effect a reciprocal rescue agreement. Back-up rescue off the mountain is located at Anchorage, Alaska, and will be provided by the Alaska Rescue Group. The group is made up of Alaskan mountaineers and is the official mountain rescue team for Mt. McKinley Park.

EQUIPMENT:

Equipment will be off-the-shelf issue Pararescue gear. A complete equipment list is located in attachment 1. No purchases of equipment will be made specifically for this trip.

COMMUNICATIONS:

Ground-to-air communications will be via PRC-90 radio on 282.8.

EMERGENCY COMMUNICATIONS:

In the event of an emergency which requires outside notification and assistance, we will attempt contact with any aircraft on 243.0. Mt. McKinley is on a major air route between Anchorage and Fairbanks and numerous aircraft pass close to the mountain each day. In the event that no voice contact, we will switch to 243.0 beeper and will leave the beeper on during hours of daylight or until a rescue aircraft flies overhead. 243.0 will not be used unless immediate assistance is required.

COMMUNCIATIONS SCHEDULE:

No fixed communication schedule will be set up. However, when 71st ARRS are able to swing by our location during their training missions, we will communicate with them on 282.8. At any time we see an Air Force aircraft in area, we will attempt to contact them on 282.8 and confirm our status with them.

FOOD:

We will pack in food for 30 days. Five days food will be left at Camp 1 as a reserve in the event of bad weather preventing our pick-up. The other 25 days food will be packed up the mountain. Each section will provide each of their participants in this mission with one LURP per day on the mountain for a total of 30 LURPS per man. Thses will be used for the evening meal each day. Each participant in this exercise will provide his own other two meals at his own expense. A detailed menu is on attachment 2.

CLIMB PHILOSOPHY - Upon arriving at Camp 1, we will set up a static camp where we will leave a lot of our gear cached. We will stay at Camp 1 for 72 hours for the purpose of acclimatizing both physically and mentally to our new enviornment. Movement from camp to camp will be done with standard roped glacier travel procedures. The entire route will be wanded to facilitate our descent. All travel will be done in a leisurely manner and with light loads to assist in acclimatization. A two-day acclimatization stop

will be made at 10,000'. Another two-day stop will be made at 14,300'. In this way we will be as acclimatized as nature permits for our summit bid. At all times safety will be our primary concern and at any time it looks as though safety will be compromised, we will back off and regroup until it is safe to proceed.

NECESSARY CORRESPONDENCE:

Two forms must be filled out prior to our climb and submitted to the National Park Service. These forms are included in attachments 3 and 4. Copies of these forms are being sent to applicable pararescuemen. They will return them to SSgt LaPointe in Alaska and he will hand carry them to the National Park Service climbing staff at McKinley Park, if this project is approved by HQ ARRS.

ORDERS:

Personnel selected for this trip will be placed on TDY orders.

TRAVEL TO ALASKA:

Travel to Alaska would ideally be by military aircraft. The reason for this would be the large amount of equipment that each individual would have to transport up to Alaska. If possible, perhaps an HC-130 from McClellan or the Air Guard unit at Hayward could provide transportation up to and back from Alaska.

TRANSPORTATION FROM ELMENDORF AFB TO MT. MCKINLEY AND RETURN:

Transportation to and from the mountain will be by HH-3E aircraft from the 71st ARRS. It is estimated that on each trip to McKinley, an H-3 will be able to carry 4 pararescuemen and their gear to the landing zone at 6,500' MSL. This would require two round trips by one helicopter or 1 round trip each for two helicopters. Flying time to the mountain LZ is approximately 1.5 hours by H-3. This would require approximately 6 hours flying time to support the project.

SUPPORT REQUESTED FROM 71ST ARRS:

In addition to providing transportation, it is requested that the 71st pararescue supply section provide this expedition with 25 gallons of Coleman fuel to be used in the stoves during the trip.

COORDINATION WITH NATIONAL PARK SERVICE:

Attachments 3 and 4 must be completed by participants of the climb and returned to SSgt Robert L. LaPointe, 71st ARRS Pararescue Section. The Park Service requests that normal procedures require that these forms be turned in 60 days prior to the planned departure date for arrival on the mountain. However, due to our close liaison with the McKinley Park climbing rangers, this requirement has been waived. They still request that the forms be completed and returned ASAP.

AN OBJECTIVE VIEW OF OUR CHANCES OF SUCCESS AND PROBLEMS THAT WE MAY ENCOUNTER:

We have the following items in our favor that enhance our chances of success:

a. We have a very strong party. All members of this proposed ascent know each other well. We have a larger proportion of party members who are familiar with Alaska mountaineering and its special problems than do the normal party arriving from outside.

b. We should not have any problems with leadership due to the fact that we are a military team and leadership is predetermined.

c. We have within our group a great deal of experience in cold weather mountaineering.

d. This project has been thoroughly researched in the past 8 months by the 71st ARRS. We are extremely familiar with the route and have climbed the route to within 2 days of the summit.

We recognize the following potential problems which could be faced by ANY group attempting an ascent on Mt. McKinley:

a. Potential physiological effects of altitude must be expected and understood. We thoroughly understand the problems of acclimatization and will take the necessary time to ensure that problems are prevented. If at any time a climber feels as though he is having difficulty in acclimatizing, he will be returned to a lower altitude. We will also have sufficient medical equipment on hand to treat any illnesses which may occur while on the mountain.

b. Frostbite and Hypothermia: Cold is severe on Mt. McKinley and must be protected against. Careful attention to clothing will be observed at all times while on the mountain. Each climber will be briefed so that he understands the effect that cold could have on his body. These briefings will be given by 71st ARRS Pararescue Team members.

c. Crevasses and Avalanches: these do, on occasion, present problems. Team members will stay roped at all times while traveling on glaciers. Before unroping at camps, the camping area will be thoroughly checked. Camps will never be set up in possible slide areas. No one will venture outside the camp for any reason without permission from the leader.

The main solution to all these potential problems is a thorough understanding of the problem. The majority of potential team members have at this time the knowledge to avoid these problems. Team members who do not understand any of these problems will be educated prior to climbing on the mountain.

I feel that we have a more than average chance of safely accomplishing our goal of climbing Mt. McKinley. We have a strong team which is very safety conscious. EVERYONE ON THIS TEAM UNDERSTANDS THAT OUR FIRST AND PRIMARY OBJECTIVE IS TO ENSURE THAT ALL TEAM MEMBERS SAFELY RETURN FROM THIS EXERCISE. The mountain will only be climbed as long as it is safe to do so. Our knowledge of the mountain and our respect for it exceed that of the normal civilian team which attempts an ascent. Our research for this project has

been thorough and is unending. Equipment and menus have been tested on Mt. McKinley and have both proved satisfactory.

Attachment # 3

United States Department of the Interior

NATIONAL PARK SERVICE
Mount McKinley National Park
McKinley Park, Alaska 99755

M 87-6
(Rev. 8/74)

APPLICATION TO PARTICIPATE IN MOUNTAINEERING EXPEDITION

I. BASIC INFORMATION

Name _____ Age _____

Mailing Address _____

Home Address _____

Emergency Notification _____ Phone No. _____

Expedition Name _____

II. LIST MEMBERSHIP in mountaineering clubs and rescue groups. Official rating in club e.g. "Leader," "Rope Leader," etc. _____

III. DESCRIBE MAJOR CLIMBS

List below and on separate sheet climbs or glacier tours you have made which required significant roped climbing. Omit short rock climbs and peaks of no technical difficulty. List climbs by year. If your experience on major peaks is extensive, list only your ten most important climbs.

For each climb, specify the following:
1. Name of peak 2. Year 3. Route 4. Leader 5. Responsibility (example given below):

L . . .Led. Fully responsible for the climb. Name one or two members.
SL . . . Shared lead. Shared leadership responsibility
RL . . . Rope Leader throughout the climb.
ARL . . . Alternated Rope Leads
M . . . Member
C . . . Client of professional guide

IV. PROVIDE A BRIEF RESUME of your other mountaineering background, outdoor experiences and physical training stressing items which will help us to understand your qualifications for arctic mountaineering at high altitudes.

RETURN ONLY TO MOUNT McKINLEY NATIONAL PARK

_____ _____
Signature of applicant Date

ATCH 3

Attachment # 4

United States Department of the Interior

NATIONAL PARK SERVICE
Mount McKinley National Park
McKinley Park, Alaska 99755

M 87-6
(Rev. 8/74)

APPLICATION TO PARTICIPATE IN MOUNTAINEERING EXPEDITION

PHYSICIAN'S CERTIFICATE

TO THE EXAMINING PHYSICIAN:

The bearer plans to participate in expeditionary mountaineering in Mount McKinley National Park, Alaska. In the interest of personal safety the National Park Service wishes to be assured that he is in physical and mental condition to endure the extreme stresses associated with arctic mountaineering.

The climber will be carrying heavy loads (often 60-90 lbs.) at altitudes between 10,000 and 20,000 feet. Conditions vary from intense snow glare with temperatures as high as 90°F to storms with winds of over 100 mph and temeratures of 40°F Below zero. Expeditions usually last from two to six weeks. Prolonged confinement within cramped tents or snow caves due to bad weather often occurs. Rescue may be exceedingly slow and uncertain in case of serious injury or illness.

Headache, irritability, sleeplessness, periodic breathing, anorexia, nausea, meteorism, sore muscles, and intense fatigue are common during high climbs on Mt. McKinley. More serious problems include cold injury (particularly to feet), snowblindness, retinal hemorrhage, cerebral edema causing ataxia, stupor, and coma, and high-altitude pulmonary edema. In addition injuries due to falls, avalanches and fires in tents may occur.

Should the bearer's expedition not include a physician among its personnel, it is important that its members receive sound medical advice prior to the trip. Barbiturates are useful to assure sleep after injury or illness on the mountain. An oral antibiotic drug should be included in the medical kit. Rectal suppositories to control nausea and vomiting and oral medication for both mild and severe pain are advisable. Progressive mountain sickness must be treated by a quick descent to a lower altitude. Digitalis does not help high-altitude pulmonary edema, but morphine and diuretic agents are beneficial if used cautiously. Dexamethasone or betamethasone seem to lessen high-altitude cerebral edema. Your professional advice and assistance in these matters could prove very valuable.

I CERTIFY THAT I HAVE EXAMINED _____ ON THIS DATE _____
AND HAVE FOUND HIM PHYSICALLY AND TEMPERAMENTALLY FIT FOR THE PROPOSED MOUNTAINEERING EXPEDITION.

SIGNED _____

ADDRESS _____

_____

ATCH 4

Attachment # 1

EQUIPMENT

BOOTS, VAPOR BARRIER (Bunny Boot)	1 pair per man
CRAMPONS (Fitted to boots)	1 pair per man
SNOWSHOES, TRAIL	1 pair per man
STOVE, OPTIMUS 111B,	4ea
ICE AXE	1 per man 1 spare
SHOVEL, ALUMINUM, GRAIN SCOOP	2ea
SHOVEL SMALL (for shaping inside roof of snow cave)	1ea
WIST BROOM	1ea
TENT, REI, McKINLEY	1 per 4 men
SLEEPING BAG, DOWN with at least 3 lbs. of down	1 per man
SLEEPING BAG, FIBERFILL, DACRON 2	1 per man optional
FOAM PAD, THERMOBAR	1 per man
ROPE, 11mm X 165', PERLON 9mm X 165', PERLON authorized substitute	1 per 3 men 1 spare
SUN GOGGLES	2 pair per man
POT, 2qt with lid	3ea
MEDICAL KIT (see attachment 5)	1 ea
INDIVIDUAL FIRST AID KITS	1 per man
ALTIMETER	1ea
LONG JOHN BOTTOMS	3 per man
PANTS, HEAVY WOOL	2 per man
SOCKS, WOOL, HEAVY DUTY	6 pr per man
BALACLAVA, WOOL	2 per man
GLOVES, DARCSTEIN, WOOL	2 pair per man
GAUNTLETS	1 pair per man

ATCH 1

EQUIPMENT
Cont.

SHIRT, WOOL	2 per man
TEE SHIRT, COTTON	3 per man
UNERWARE, COTTON	3 per man
DOWN BOOTIES	1 per man
OVERBOOTS OR GAITERS	1 pair per man
EXPEDITION DOWN PARKA	1 per man
EXPEDITION DOWN PANTS	1 per man
WIND PANTS	1 per man
WIND PARKA	1 per man
QUILTED UNDERWARE, TOP AND BOTTOM	1 pair per man
CAMERA	
FILM	
WATER CONTAINEERS	1 per man
MAPS	
SPOON PLASTIC	6 per man
CUP PLASTIC	1 per man 2 spare
CANDLES, ROUND STUBBY	6 per man
MATCHES	
M-13 DAY/NIGHT FLARE	3ea
GYROJETS AIRBORNE FLARES	1set
MIRROR	2ea
STROBE LIGHT	1ea
RADIO, PRC-90 SPARE BATTERIES	2ea 6ea
THEMOMETER	1ea
TRAIL WANDS, 3'	500ea
TOILET PAPER	3 rools

ATCH 1

EQUIPMENT
Cont.

TOOTHBRUSH	1 per man
SHAVING GEAR	per man
COMPASS	1ea
SNOW PICKETS	6 ea
SNOW FLUKES with 8' 7mm line	1 per man
CARABINERS, LOCKING D	4 per man
SEAT & CHEST HARNESS	1 per man
JUMARS	1 per man
PULLEY	1 per man
PAPER BACK BOOKS	
DIARY	
PENCILS	

REPAIR KIT: WIRE, 550 CORD, small needle nose pliers, rip stop tape, extra small pack parts, sewing gear

ATCH 1

MENU

30 MAN DAYS OF FOOD WILL BE PACKED AND SHIPPED TO THE MOUNTAIN. ESTIMATED TIME TO COMPLETE THE CLIMB IS 20 DAYS. THIS ALLOWS US A 33% FOOD RESERVE FOR UNEXPECTED DELAYS IN RETURNING TO ELMENDORF AIR FORCE BASE.

BREAKFAST # 1

OATMEAL, INSTANT
GRANOLA BAR
HOT COCOA
ORANGE JUICE
TEA
SUGAR

BREAKFAST # 2

COLD CEREAL with INSTANT MILK
COCOA
GRANOLA BAR
TEA
ORANGE JUICE
SUGAR

LUNCH

GORP
SALAMI
KOOL-AID
COOKIES

THIS MENU PROVIDES 5,000 CALORIES PER MAN PER DAY.

TOTAL ESTIMATED COST OF THIS 30 DAY MENU IS $ 40.00 per MAN (LURPS NOT INCLUDED IN THIS ESTIMATE)

SUPPER

LURPS
CUP-A-SOUP
KOOL-AID
TEA
SUGAR
BANANA NUT BREAD

EVENING SNACK

TEA OR COCOA
COOKIES
CANDY BAR (Below 14,000')

IT SHOULD BE POINTED OUT THAT THIS MENU HAS BEEN TRIED AND PROVEN DURING REPEATED MOUNTAINEERING VENTURES BY THE 71st ARRS. IT IS THE RESULT OF MANY TRIPS AND MANY DIFFERENT MENUS. IT WAS TRIED ON MCKINLEY FOR 10 DAYS AND PROVED TO BE HIGHLY SATISFACTORY.

THE FOOD IS PRE-WEIGHED AND SEPARATED INTO THE NECESSARY MEALS AND THEN PACKAGED INTO 1 MEAL FOR 3 or 4 PERSONS IN A HEAT SEALED PLASTIC BAG. THE BAF IS THEN MARKED AS TO THE TYPE OF MEAL AND WHICH DAY IT SHOULD BE USED ON.

THE MAIN ADVANTAGE OF THIS MENU IS THAT NO MEAL MUST BE COOKED. ALL THAT THE HOT MEALS REQUIRE IS THE ADDITION OF HOT WATER. CLEAN-UP AFTER EACH MEAL IS THEN MINIMAL.

ATCH 2

United States Department of the Interior
NATIONAL PARK SERVICE
Mount McKinley National Park
Post Office Box 9
McKinley Park, Alaska 99755

IN REPLY REFER TO:
L3423

November 21, 1975

Memorandum

To: Mount McKinley Mountaineers

From: Mount McKinley National Park

Subject: Mountaineering Environmental Ethics

Attached is an excerpt from the recent and ongoing Denali Environmental Project (DAEP).

Its main purpose is to give you, the mountaineer, guidelines to use during your upcoming expedition in relation to mountaineering waste removal and disposal on Mount McKinley. This is something that all groups must be a part of if it is to be a successful program.

Mainly we would like you to be sure and properly take care of all trash generated by your party if you would like to assist in cleaning up 'Denali' all the better. Ideally nothing should be left on the mountain except properly disposed of human excrement. All packaging materials and supplies should be burned or carried off the mountain.

If you have any questions or misunderstandings of the objectives of this program please contact us.

Gary Brown
Chief Park Ranger

9950

AMERICAN REVOLUTION BICENTENNIAL 1776-1976

ATCH 6

I

AN OVERVIEW

The Denali Arctic Environmental Project was initiated in an attempt to contribute to a new ethic in mountaineering and wilderness use--a consciousness that a wild area is not something to be conquered by man, but a natural phenomenon to be lived with, appreciated, and exploited only in the sense that its values may be used to enlarge man's human experiences. Central to this consciousness is a desire to leave a mountain or any natural landscape in a condition "untrammeled by man, where man himself is a visitor who does not remain."

As the highest point on the North American continent, Mt. McKinley was selected as the target for the initial clean up of the project. The West Buttress Route is today the most popular and easiest approach to the summit. The irresponsibility of previous expeditions in the pollution of this route, one of earth's most frequented high places, is a deplorable episode in an otherwise noble pursuit.

In 1971, seven McKinley climbers from Oregon attempted the climb of the West Buttress. Before the climb, they stated their desire to carry all their litter off and to leave nothing on the mountain. They were successful in this endeavor and the idea of a large-scale clean-up was born.

Throughout the 1972-73 winter, schools throughout the Northwest engaged in winter climbs and excursions with particular emphasis on environmental concerns as a part of the Denali Arctic Environmental Project (D.A.E.P.)

During the spring of 1973, two expeditions were placed on the West Buttress Route of Mt. McKinley as a

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part of the D.A.E.P. DAEP I spent 21 days on the mountain from April 27 to May 18, 1973, and reached an altitude of 17,200 feet. DAEP II spent 23 days on the mountain from May 29 to June 20, 1973, and was successful in reaching the summit. Both expeditions collected, burned and carried out litter found on the West Buttress Route in addition to developing and testing various expeditionary mountaineering environmental practices.

Two major areas of litter remain on the mountain. There are numerous dumps throughout a narrow glacial passage ranging in elevation from 12,000 to 13,000 feet. DAEP found generally bad weather and an unlikely camping area near the first locale known as "Windy Corner", and despite a strenuous effort over several days, could only collect a small part of the litter in the second area at 17,200 feet. The DAEP has demonstrated that these problems, if difficult, are solvable. It also demonstrated that it is possible to live on a mountain for extended periods under severe conditions and to gain the summit while maintaining sound environmental practices. But the DAEP has also demonstrated that environmental problems attendent to mountaineering can not be solved by one expedition. It will take the concerted effort of all mountaineers to solve present and prevent future garbage and litter problems in the mountains.

The following includes (1) a report which identifies common camp and consequent litter areas found on the West Buttress Route of Mt. McKinley and the environmental action in which the DAEP was successful; (2) initial environmental practices report; (3) specific recommendations to Mt. McKinley National Park Service; and finally, (4) a proposal for a continuing environmental mountaineering program in the future.

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II

MCKINLEY WEST BUTTRESS LITTER PROBLEMS: DAEP ACTION

Landing Camp A surprising amount of litter, abandoned equipment, and food are in the landing camp area, particularly around the two radio camps. Much of the litter is covered by snow and visible only during certain snow conditions. The DAEP collected and burned all visible garbage around the radio camps. Fresh snowfall covered much of the littered area and prevented a complete clean-up. Additional garbage and litter will undoubtedly surface later in the year. Additional clean-up in the area would be facilitated by its proximity to the landing strip. Litter may sometimes be left in the landing area when parties depart the mountain in full aircraft. Pilots serving the landing area should be encouraged to carry out litter whenever space permits.

Main Kahiltna Glacier (6700 to 11,000 feet) Continuous movement of the glacier and frequent snowfall serve to reduce accumulation of litter in concentrated areas. Most of the litter encountered appears to be left by parties immediately ahead on the route. The DAEP collected and burned all such litter that was found along this route. Permanent environmental damage in this area appears minor. Parties climbing the mountain can easily ensure that those who follow have a clean and enjoyable route by collecting and removing all evidence of their passing.

Below Windy Corner (12,000 to 13,000 feet) Assorted dumps exist at approximately 20 different places. Almost all contained broken or burned green plastic garbage containers. Food (most unusable), garbage, residue from burning, skis, gas cans, plastic rope, and

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poles plus some human waste were found at the dumps. Much of the debris in this area is encrusted in ice and must be chopped out. A large portion of this litter is so ice encrusted that it can not be easily burned. A cooperative effort by the Park Service, Alaska Mountain Guides, National Guard, and expeditions like the DAEP will be necessary to adequately deal with the problems in this area.

14,000 feet Most caches and garbage left in this area are deeply buried and will probably never be found again. Again, the litter encountered appears to have been left by parties immediately ahead on the route. The DAEP collected and burned all such litter. Other parties can easily follow similar practices.

West Buttress Ridge (16,000 to 17,000 feet) Garbage along the ridge is isolated and not extensive. The DAEP collected the litter from two dumps, packed it to 14,000 feet, and burned it. Any remaining litter is isolated and should be fairly easy to remove.

High Camp (17,200 feet) Litter, garbage, human waste, abandoned food and equipment have accumulated in a concentrated area over a period of years and now presents the most serious environmental problem on the mountain. The accumulation is most severe in and around the permanent ice cave at this site. A large pit in the cave contained a dump of litter, garbage, food (much unusable or opened), fuel cans (most empty), plastic, oxygen bottles, abandoned equipment, and cans of frozen human waste. Nearly the entire area surrounding the cave is strewn with litter, garbage, and human waste. Numerous piles of human waste surround the cave entrance. Other sites at 17,200 feet contained abandoned items

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of equipment including fuel cans, pickets, tents, parachutes, food, and were strewn with scattered garbage and litter and human waste. The University of Oregon McKinley Expedition of 1971 found a similar situation in May of '71 and spent one day cleaning this area. The DAEP spent two full days and parts of two other days chopping garbage, litter, and human waste out of the ice, collecting the same, and burning as much as possible. Much of the litter was so ice encrusted that burning was not possible. The DAEP cleaned the garbage, litter, and waste from the ice cave and consolidated the usable food. Participants were only able to pack a minor part of the collected garbage from this altitude. Four sacks of consolidated garbage remain at the site and significant amounts of garbage and waste remain frozen in the snow and ice. Altitude and weather severely hinder cleanup operations in the high camp area. Further, most garbage collected in the area must be packed to a lower elevation for air evacuation. An extremely powerful expedition, exceeding in numbers by many times that of the DAEP, will be necessary to deal adequately with the problem. The seriousness of the environmental problem at the high camp and the difficulty of dealing with the problem provide a sad demonstration of the need for all climbing expeditions to engage in sound environmental practices.

Despite the DAEP effort, the solution to the problem of garbage, trash, and litter on Mt. McKinley remains for the future. It is clear that no one expedition can ever hope to cope with the problem. It is a task that must concern every expedition that climbs on Mt. McKinley. As the use of Mt. McKinley, and especially the popular West Buttress Route, increases, environmental deterioration

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may spoil the magnificence and grandeur of this great peak unless nearly every expedition that climbs on the mountain practices greater environmental care. At least, every expedition should endeavor to leave their route clean and unmarked. Ideally, every expedition should endeavor to clean up, where possible, the trailings of thoughtless others who have gone before. All of the major routes on Mt. McKinley have now been climbed at least once. But with a concerted effort by all who climb on Mt. McKinley, there is no reason that every climber can not enjoy the "Great One" in a splendid state of virginity.

ATCH 6

III

DAEP ENVIRONMENTAL PRACTICES REPORT

We believe that most mountaineers, once conscious of the environmental problems associated with high altitude mountaineering, will act to deal with these problems by adopting and practicing sound mountaineering environmental practices. Yet there is little in the environmental or winter camping literature to guide the mountaineer in dealing with many of the problems. The following recommendations have evolved from the experiences of several environmental expeditions on Mt. McKinley and on numerous lesser peaks. The recommendations are not considered definitive, but it is hoped that they will stimulate thought and discussion and contribute to better mountaineering environmental practices on the part of all mountaineers.

A suggested wilderness mandate!

Leave Nothing on the Mountain. This is a simple and sound suggestion, yet it is surprisingly hard to follow. Most expeditions, whether successful or unsuccessful, find they want to depart a mountain with speed. An expedition must make a personal commitment to follow this mandate and then stick to that commitment. Success in this regard is more likely if an expedition plans for and executes the ascent of a mountain so that complete evacuation of all food, equipment, and litter is facilitated. Participants in DAEP moved the necessary food, personal equipment and spare equipment up the mountain to successfully gain the summit in addition to carrying out extensive clean-up activities. Furthermore, through careful planning and preparation they were able to carry everything off of the mountain without hardship, including a substantial amount of litter left

ATCH 6

by others. The following are positive suggestions to facilitate the solution of food, litter and human waste problems encountered by expeditions.

Food - Repackage food so that the packaging can be easily burned. The DAEP utilized freeze-dried food whenever possible. The food was found to be easy to repackage, easy to prepare, tasty and lightweight to carry off of the mountain. The food was rehydrated as needed and the need to dispose of uneaten, rehydrated food was minimized. Few canned goods were utilized in order to minimize the number of empty tins to be carried out.

Food Sacks - Pack food in containers that can be easily burned or carried off of the mountain. The DAEP utilized large sacks of 6 oz. waterproof nylon to pack food. The sacks fit easily into pack bags and were found to provide adequate protection against weather and animals. Further testing of the sacks is required however. The sacks served as garbage and litter containers when empty and unused sacks were easily stuffed and transported off of the mountain.

Litter Collection - Keep litter dry. The DAEP kept all expedition litter dry in plastic bags until it was burned. Damp or frozen litter found on the mountain was placed in separate bags. An entire bag of dry litter can be burned with as little as a half cup of gas. Wet or frozen litter requires much more gas to burn and may not burn at all.

Litter Burning - Burn litter during the ascent. The DAEP found that about two hours are required to completely burn three days of accumulated garbage. Moreover, litter burning was in fact an enjoyable task during pleasant windless periods. Conditions and

ATCH 6

haste during the descent may preclude burning. The DAEP found that by burning all possible litter, the total amount of expedition garbage to be carried off the mountain including all burning residue, fuel cans, and broken equipment was reduced to 3-4 sacks weighing about 25 to 35 pounds. Litter from each camp can be cached with spare food and fuel and picked up on the descent.

Spare fuel - Carry extra fuel for burning litter. The DAEP found three gallons (per expedition) to be sufficient to burn all expedition litter, plus all of the other litter collected on the route.

Burning Method - Two different methods were found to be adequate for burning.

1) An incinerator was made from a gallon fuel can (or a five-gallon can where these had been left as garbage by previous parties). Garbage was collected in large plastic bags which had previously held unused food. A small amount of gas was poured into the sack and allowed to soak all items held within. A fire was started in the incinerator and a hand full of soaked garbage was burned at a time until everything was gone. The remaining burned debris was collected in the plastic sack and amounted to about 1/25 of the bulk and weight of the unburned garbage.

2) A snow hole was dug and tin foil wrappers from freeze-dried food were placed in the bottom and sides. The hole acted as the incinerator. The same process as above was followed. This tin foil prevented the fire from burning a deep hole in the snow and allowed us to collect every piece of debris. By poking and holding the tinfoil with a wand, even it would burn at the end of the fire.

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unchecked, unregulated cache system will encourage garbage dumping by tired climbers who no longer desire to carry extra food and equipment items which have little value at the time. Even valuable items are often left if a climber does not want to carry an extra load or some extra pounds. However, these are never useful caches and should not be encouraged in any form. Everything which an expedition brings to a mountain may be carried off. The lowest cost, most easily managed environmental program is one which puts all litter and safety responsibilities on the climbing expeditions and their members.

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IV

RECOMMENDATIONS TO NATIONAL PARK SERVICE, MT. MCKINLEY NATIONAL PARK

1. Include a statement of environmental problems on Mt. McKinley in the Park Service publication "Climbing Problems on Mt. McKinley."

2. Make permission to climb in the National Park contingent upon agreement by the climbers to remove all their equipment and litter from their route and leave nothing on their route.

3. Require all expeditions to file an environmental report regarding problems noted and corrective action taken, if any.

4. Publicize the nature and seriousness of environmental problems caused by climbers on high arctic peaks including McKinley.

5. Organize and support the clean up of seriously damaged areas within the National Park including the evacuation of garbage and litter from high altitude areas as budget permits.

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V

THE FUTURE

DAEP is just the beginning. DAEP will continue and hopefully other groups will join in. But the ultimate goal of DAEP lies beyond "garbage collection" Remedial measures are never satisfactory. Our goal lies in prevention--in reducing or stopping entirely the environmental deterioration of our mountain and other wilderness. We are now in an age when mountaineers can no longer put reaching the summit above all else. Our belief is that the first-class ascent on any climbing route, no matter how easy or difficult, must leave no trace of passage. We all long for the quality of the first ascent..."...the untrodden, virgin, trackless, pure, unclimbed..." First ascents are becoming rare. But we can all still enjoy the quality of the first ascent. We see no reason that 100 or even 1000 or more parties can not enjoy the challenge, the experience, the excitement, and the splendor that the first party finds on a mountain route if all cooperate to make this possible.

ATCH 6

71st ARRS
Pararescue

MEDICAL PROBLEMS OF HIGH ALTITUDE MOUNTAINEERING

I) Acute Mountain Sickness

Symptoms:	headache, dizziness, lassitude
	loss of appetite, nausea
	trouble sleeping
signs:	rapid breathing
	rapid heart rate
treatment:	descend if severe
	rest
	eat and drink liquids
	short periods of voluntary hyperventilation may alleviate symptoms.

II) High Altitude Pulmonary Edema

Symptoms:	Same as I plus:
	*shortness of breath at rest - key symptom
	persistent cough
	sensation of pressure in the chest
	shortness of breath increases when lying down
signs:	irregular breathing
	Chene-Stokes respiration (hyperventilation followed by short periods in which breathing stops)
	gurggling, frothing respiration
	wheezing
	rales in lungs (crackling sounds heard with stethoscope)
treatment:	DESCEND immediately
	continuous oxygen by tight fitting mask at 6-8 liters/hour (if available).
	avoid exertion
	rest in semi-sitting position
	if descent is delayed or patient is worsening give Lasix 20 to 40 mg every 6-12 hours.

III) High Altitude Cerebral Edema

symptoms:	same as I plus:
& signs:	severe persistent headache
	depressed mentation - forgetfulness, loss of judgement foggy thinking, confusion
	nausea and vomiting
	loss of balance - drunken gait
	weakness of arms, legs, cranial nerves particularly on one side of body
	hallucinations
	seizures
	unconsciousness, coma

1.

ATCH 7

DA

DEPARTMENT OF THE AIR FORCE
71st AEROSPACE RESCUE AND RECOVERY SQUADRON (MAC)
APO SEATTLE 98742

REPLY TO ATTN OF: DOPJ/752-4888

5 MAR 1976

SUBJECT: 1976 ARRS Mt McKinley Expedition

TO: 71ARRS/CC
ARRS/SG
IN TURN

1. Military rescue capabilities in mountainous terrain at altitudes above 14,000 feet are virtually non-existent. The steady increase of human activities at high altitude entails the occurence of accidents by increasing numbers. Aircraft incidents at high elevations are a reality to predict. The need for organized rescue to be mobilized on short notice becomes an obvious requirement. East-block nations have established such capabilities; it must be obvious to them to realize its military value. The USA should not lag behind.

2. A high-altitude rescue plan must be developed. It must include selection criteria for suitable personnel, equipment and training requirements, appoint responsible ARRS units, and a directive sequence of required actions to mobilize and effect high-altitude rescue operation.

3. Prior to the compiling of such plan, knowledge and experience must be gained as a foundation to sound and efficient high-altitude rescue capabilities. Motivation and dedication to such undertaking is also a factor which is of prime importance to assure success. Essential knowledge of high-altitude mountaineering procedures, its hazards and its various aspects, is available through numerous individual and scientific reports and studies. This is tremendously helpful in planning high-altitude rescue operations. However, actual experiences of organized rescue activities are underdeveloped and unsatisfactory in documentation. Experienced mountaineers and expeditioneers reflect in numerous reports the need for organized high-altitude rescue teams, but recognize the difficulty of organizing such teams due to the widespread locations of individuals and the logistic problems involved.

4. Consequently, the experience gained by pararescuemen in the proposed Mount McKinley Expedition closes the gap and provides essential data for compiling a workable high-altitude rescue plan. The benefit of first-hand experience is not only to collect valuable data on procedures, equipment, and environmental considerations, but also establish factors of team limitations, the recognition of symptoms and signs of high-altitude sicknesses, travel and acclimatization problems, and personal limitations.

5. I urge the approval of the proposed expedition.

Udo C.J. Fischer

UDO C.J. FISCHER, SMSgt, USAF
NCOIC, Pararescue Section

1 Atch
SSgt LaPointe's Plan and all atchs

DEPARTMENT OF THE AIR FORCE
71st AEROSPACE RESCUE AND RECOVERY SQUADRON (MAC)
APO SEATTLE 98742

REPLY TO ATTN OF: DOPJ (SSgt Robert L. LaPointe, 752-4888) 4 MAR 1976

SUBJECT: 1976 ARRS Mt. McKinley Expedition

TO: 71 ARRS/CC
HQ, ARRS/SG
IN TURN

1. Enclosed is a plan for the proposed 1976 ARRS Team to ascend Mt. McKinley. It will be noted that this plan is of a smaller scale than that submitted by MSgt Robert Watkins of the 303rd ARRS. The purpose of a smaller team is to allow easier coordination between team members before the climb and better command and control of the team while on the mountain. While the loss of MSgt Watkins presence during this climb is regretable, it should not be construed that his participation was essential to the safe completion of this project. We have within the pararescue force other individuals who have the necessary knowledge, experience, and mountaineering background to safely and successfully carry through this proposed project.

2. The objectives of this expedition whould be as follows:

a. Climb to the top of Mt. McKinley (20,320') if it is safe to do so. At any time that safety is compromised (i.e. bad weather, trouble acclimating, etc.) we will back off and regroup until it is safe to continue. Everyone on this team will understand that our primary responsibility is to ensure that each of us return safely from this project.

b. Sub-arctic living in an extreme cold weather environment.

c. Glacial travel and mountain cross country navigation.

d. Construction of snow shelters.

e. Testing of pararescue equipment in extreme temperatures:

(1) Clothing

(2) Equipment

f. Use of climbing gear on varying terrain (e.g. ropes, screws, pickets, jumars, etc.)

g. The begining formation of a group of ARRS climbers who have climbed together as a team using standard pararescue equipment for the purpose of forming the nucleus of a high altitude SAR team.

h. Upon completion of this exercise, the compiling of a report on a high altitude operation giving future recommendations on team compositions and equipment.

3. The approval of this project would have the following beneficial effects on the mission of ARRS.

a. The primary benefit of this trip would be that a nucleus of active duty supervisory personnel within the pararescue field would have had experience working together on a high-altitude mission using equipment off the shelf from their sections. This would allow ARRS HQ to have a resource to use to organize any future high-altitude SAR missions. These individuals could be used in the future to train other Pararescuemen in high-altitude operations.

b. This ascent would be the first time that an all USAF team climbed to the summit. The resulting publicity of this climb during our bicentennial celebration could be most favorable.

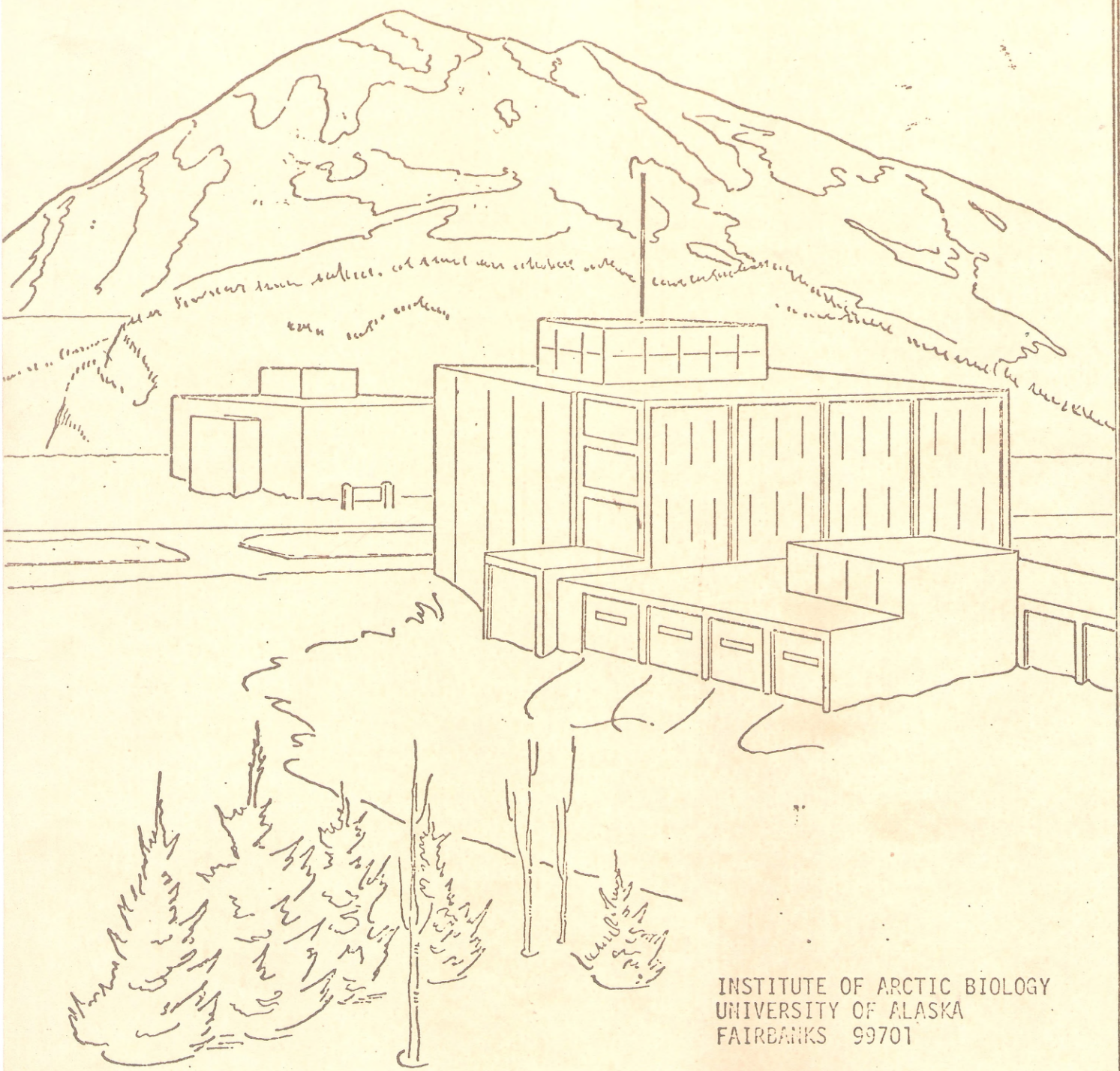
c. Also not to be overlooked would be the effect that this sort of project would have on the morale of the pararescue force. There are many within the field who believe that the days of an elite pararescue force, capable of completing unusual and difficult tasks, is slowly eroding. The approval of this sort of project would add credibility and pride to the entire career field.

Robert L. LaPointe

ROBERT L. LAPOINTE, SSgt, USAF
Pararescueman

9 Atch
1. Equipment Listing
2. Menu Listing
3. National Park Service's Application to Climb
4. National Park Service's Physician Certificate
5. State of Alaska Bicentennial Commission Letter
6. National Park Service Mountaineering Environmental Ethics
7. Medical Problems
8. High Altitude Medical Kit
9. Sgt LaPointe's Trip Report

CLIMBING PROBLEMS ON MT. McKINLEY



INSTITUTE OF ARCTIC BIOLOGY
UNIVERSITY OF ALASKA
FAIRBANKS 99701

Mt. McKinley, the highest mountain in North America, offers mountain climbers some of the most severe conditions found anywhere on earth. As Terris Moore points out in his book "Mt. McKinley: The Pioneer Climbs" when the Quartermaster Corps was searching for a place on the North American Continent where temperatures of at least -20 to -25 degrees F. could be found, dependably, during the summertime, it chose the high basin between the North and South Peaks of Mt. McKinley. Cold, lack of oxygen, and windstorm here provided conditions found only thousands of feet higher in other parts of the world. The combination of these factors with long exposure create severe hardships and pose unique problems for climbers on Mt. McKinley that are not encountered elsewhere in this country. In most cases climbers return from McKinley physically weaker than when they left. While trips to lower mountains may help build a climber's strength, a McKinley expedition may drain his strength and lead to deterioration of body functions.

This brochure presents problems, inherent in Mt. McKinley climbs, which affect the physiology of the climbers. It also presents a brief introduction to the research program being carried on at the University of Alaska to investigate these problems. It does not attempt to duplicate material presented in the National Park Service brochure (M-87) which gives requirements and suggestions of the Park Service regarding equipment, clothing, food, radio communications, climbing season, climbing routes, and reference material.

PHYSIOLOGICAL IMPAIRMENT

These responses to a prolonged and severely hostile environment constitute an interaction within the area of human ecology which is the subject of a continuing research program at the Institute of Arctic Biology of the University of Alaska. Every mountaineer preparing to climb Mt. McKinley is aware that at high altitude he will be physically weaker. He will move more slowly and not be able to carry heavy loads. There are also other results of activity at high altitude less commonly known but potentially as dangerous, such as mental impairment, dehydration, lassitude, loss of cold resistance, and lack of recuperative powers. A major environmental variable responsible for some of these effects is the lack of oxygen (hypoxia) associated with high altitudes. Terris Moore has recently pointed out (Proc. XVII Alaskan Science Conference, In Press) that because of its greater distance from the equator, an altitude on Mt. McKinley may be physiologically equivalent to a 2,000 feet higher altitude in the Himalayas. Physiological responses to these environmental stresses are under investigation at the Institute of Arctic Biology and it is hoped that such studies will contribute to the success and safety of future high altitude mountaineering expeditions.

Mental Function:

Bradford Washburn has estimated that above 18,000 feet on Mt. McKinley a person is reduced to roughly 50% of his mental capacity. In the winter assault of 1967 three McKinley climbers required approximately twice as much time to answer a series of subtraction problems after remaining at 18,000 feet for six days as they did at 7000 feet on the Kahiltna Glacier. In retrospect most high altitude climbers can recall situations in which their thinking was impaired and their judgement poor. These effects are insidious, the disability being commonly inapparent at the time. A controlled exposure in a low pressure chamber is often necessary to convince a climber (or flier) that hypoxia affects him. Many high altitude climbing accidents may be attributed to such lack of judgement. Thus, it is important that climbers realize in advance that their mental functions will be impaired. Planning should be thorough and complete to avoid a critical situation which poor judgement and slow thinking would magnify. For example, sudden impulsive decisions to go on or to return must be considered carefully.

Simple tests can be given to detect changes in mental function through effects on memory, time estimation, and calculation ability. Changes in other brain functions can be estimated by tests of balance and coordination. These tests, first administered in an altitude chamber prior to the climb, may give some indication of how a reduction in oxygen supply will reduce a climber's efficiency when he is high on the mountain.

Lassitude:

At high altitude motivation can diminish greatly. Thus, Joseph Wilcox, leader of a 1967 McKinley party wrote in his diary "With five people crammed in the tent morale decreased rapidly. There was no interest in cooking meals and by the next day no one was even interested in melting drinking water. We found ourselves very apathetic -- not caring whether or not we got enough to drink or eat or if our gear was wet -- we just lay there and waited with little or no sleep ... By morning the cold had taken its toll -- Jerry Lewis and I had numb feet and I had numb fingers." Here the motivation to do even the simplest camp chores almost disappeared; yet these tasks -- melting snow for water, cooking a hot meal, drying clothes in the wind -- will help determine the success and safety of a party. The will to survive and succeed must not be sacrificed to lassitude. Inactivity during tent-bound stormy days can itself be devastating to morale, and as tiring and debilitating as climbing. Washburn stresses how some systematic activity during stormy days such as a short walk, weather permitting, or building a latrine with snow blocks can help to keep

the body limber and the mind alert. Physiological testing can be used to alleviate boredom on days of enforced inactivity.

Leadership and Interpersonal Relationships:

Irritability can easily spring up between even close friends during a stay at altitude. A nagging fear, doubt or feeling of guilt can easily grow in a person's mind and prove mentally exhausting as well as potentially dangerous.

Leadership characteristics may undergo drastic change because of the stressful situation. Drastic personality change may bring out latent domineering tendencies in anyone which can be extremely upsetting to group relationships. Being on the mountain may precipite a variety of phobias, including claustrophobia from living in close quarters, which can lead to panic with an overwhelming desire to run away. In extreme cases a single climber may even leave the group and attempt to ascend or descend by himself, which can lead to fatal consequences.

By testing mountaineers before a climb it may be possible to detect areas of phobic preoccupation and glean personality traits which cause harmful reaction tendencies to assert themselves. A maximal understanding of these problems is essential for the smooth leadership and interpersonal relationships necessary for a successful stay on the mountain.

Work Capacity:

The capacity to carry out strenuous physical work at high altitude is an essential factor in the successful climb of any mountain. Work is limited by the ability to extract oxygen from the thin mountain air and to deliver it to the brain, muscles and other tissues. In the 1967 winter climb, for example, it was notable that the three climbers who reached the summit were those judged most physically fit at the start on the basis of standard exercise tests.

Simple step tests done in and out of an altitude chamber can give some indication of how a climber's work capacity changes with altitude and may make possible more efficient planning of the work schedule on the mountain. Tests which are done in the laboratory prior to the climb may be repeated on the mountain if a proposed high altitude laboratory is established there. This would give greater insight into what happens to a climber physically when he is on the mountain.

Acclimatization to Altitude:

S. M. Tenney emphasizes the importance of acclimatization in climbs over 15,000 feet. The McKinley Park regulation requiring climbers to begin at the Park Boundary and prohibiting air drops

inside the Park may appear hampering to an eager mountaineer. In actuality this regulation has undoubtedly contributed to the success of many expeditions, because of this necessity for the climber to gradually acclimatize to the thinner air. Carrying loads at gradually increasing altitudes is accepted as the best way to acclimatize. Some McKinley expeditions have found it very helpful not to "push" when they move above 14,000 feet but allow themselves a day or two at each high camp to adjust before moving higher.

Dehydration:

Dehydration is a major hazard of high altitude mountaineering. Dehydration compounds the problems of any illness or injury, making recovery more difficult. The chances of frostbite are believed to be much greater when a climber's body is dehydrated.

Climbers rarely drink an adequate amount of liquid above 14,000 feet. Fuel for melting snow is not difficult to carry, yet the tendency is to take only a minimum rather than an adequate amount. A party should always carry an extra week's reserve of fuel when high on McKinley. It is inviting tragedy not to have at least seven days supply of fuel if one plans to spend even one night above 17,000 feet on Mt. McKinley. This fuel must be used to provide each climber with at least three quarts of liquid each day.

The principal mechanism of dehydration is evaporation through breathing. Moist warm air is exhaled while very dry cold air - with the average humidity of a desert - is inhaled. The very large ventilation volumes needed to supply the oxygen necessary to carry heavy loads up steep inclines in the thin mountain air increases the loss to many times that under ordinary circumstances.

Water is also lost to clothing through sweating. Temperatures which can range from 60 above to 40 below zero Fahrenheit are conducive to sweating and chill when combined with the work performed and the severe winds encountered on the mountain.

Dehydration causes a reduction in blood volume and an increase in blood viscosity. Further, it upsets the body electrolyte balance which disturbs the acid-base balance of the blood. These changes affect both the muscles and the mental functions of a climber.

Illness or Injury:

It is virtually impossible for the body to recover from many illnesses and injuries above 14,000 feet. Hypoxia and dehydration seriously impair the body's recuperative powers. A sick person should if possible be taken immediately below 14,000

feet where he will have a better chance of recovery.

Altitude nausea and dizziness will often disappear if a climber goes to a lower altitude. Even after one night below 14,000 feet the climber may feel fit and subsequently be able to climb to 20,320 feet.

Diarrhea can be fatal when climbing above 14,000 feet. Dehydration is further aggravated and with impaired absorption the body receives little nourishment and is further weakened. A person suffering from diarrhea above 14,000 feet should be taken below 14,000 feet while he can still make the trip down. He should not go up again until his gastro-intestinal function returns to normal.

A person with wheezing, gasping, and coughing, suggestive of pulmonary edema, should be immediately taken to as low an altitude as possible. Some relief from pulmonary edema can be obtained on the mountain if the climbers are able to use proper medical treatment and have had instruction from a physician on this matter. Cardiac and pulmonary dysfunction are grave dangers on the mountain, and their debilitating effects increase exponentially. Therefore, action must be taken immediately. Waiting under hypoxic conditions can be fatal. Death can come only hours after the first symtoms appear. The best therapy is to transport the climber to below 10,000 feet as quickly as possible.

Cold Resistance:

One of the major hazards of a McKinley climb is frostbite. Mt. McKinley presents a combination of long exposure, severe weather, high altitude, low temperature and low humidity which makes it one of the most severe climates on earth. Mountaineering literature contains numerous vivid accounts of frostbite on Mt. McKinley such as Bradford Washburn's excellent article which can be obtained from the American Alpine Club. With proper protection, however, this complication need never occur. Adequate clothing, food and water are essential at all times. Three 1967 winter McKinley climbers had their feet frostbitten while they were in their sleeping bags primarily because they had little to eat and were dehydrated. Subsequently two of these climbers lost portions of their toes. It should be pointed out, however, that they were living at 18,000 feet for six days with temperatures of -50 to -60 degrees Fahrenheit and winds of 90 - 100 mph. If they had not kept calm and retained a degree of awareness of the major problems, or had let panic or unreasonable fear overwhelm them, they might have fared far worse. It is believed that cold resistance may be impaired by altered nervous or metabolic regulatory control.

A measure of cold resistance is gained in the laboratory by analyzing functional efficiency as it changes in the presence

of cold exposure. Such things as rapid, successive finger movements, sensitivity of fingers, alteration of peripheral nerve conduction, and ability to perform useful work can be measured. These measurements can give one some idea of ability to be expected under certain conditions of cold.

It should be unnecessary to reiterate the probable deleterious effects of smoking tobacco on a high altitude climber. Not only may physical endurance be decreased but peripheral circulation is likely restricted so that cold injury is more likely to occur.

FATIGUE:

Another aspect worthy of note is that virtually all of the difficulties outlined above may be preceeded or compounded by over fatigue - usually by one member of the party before the others. When such indications are first observed the party should stop, rest and recuperate.

To a considerable extent, Mt. KcKinley represents a problem in logistics and weathter so that climbers often feel that they must make the best use of good climbing conditions even though it may over extend the physical and emotional capabilities of some or all of the party. If violent weather overtakes them in this condition, tragedy can follow. Climbers must maintain a physiological margin of safety against fatigue and cold just as they do for food and fuel. In this connection it has been suggested that the extra effort of preparing igloos or snow caves for shelter at high altitude rather than putting up tents, is well worth while in terms of the greater protection and rest afforded.

MOUNTAINEERING SCIENCE AT THE U OF A

Alaskan Mountaineering Center:

A proposed Mountaineering Center at the University of Alaska would provide housing for the climbers while they are being tested prior to and after their climb. It would also provide a necessary staging area where they could repack and distribute their equipment and supplies, and make last minute preparations and repairs before the climb. Climbers could also take advantage of maps, photographs, diaries of previous climbs, journals, and research in general or on details of the specific climb they intend to attempt.

Research in Human Ecology:

The Alaska Mountaineering Center would be integrated into the ongoing research program of mountaineering science at the Institute of Arctic Biology. As an aspect of Human Ecology

this program has passed through a developmental phase to emerge as one of the major interests at the Institute. A considerable professional and technical staff - some of them mountaineers themselves - are involved in conducting research into the stress responses due to cold and altitude as seen both in subjects in the controlled altitude chamber and in mountaineers while climbing. Added to this "in house" staff are visiting scientists who come from other parts of the United States and the world for this opportunity to study stress responses to extreme conditions of cold and/or altitude made possible by the continguity of modern laboratory facilities, specialized professional staff, and high mountains and other environments in Alaska.

Direct Advantages to Mountaineers:

By previous contact with mountaineers it has been found that these highly motivated young men see considerable advantage to participation in mountaineering research for themselves as mountaineers, and they have come to appreciate the many aspects of basic research as well. Their participation in previous studies has resulted in scientific collaboration and major improvement in testing techniques.

All of the tests administered are designed to increase knowledge in the area of physiological stress due to altitude and adjunct stresses and thereby assist mountain climbers in making their climbs safely and more assured of success. The fact that, as valuable experimental material, injured mountaineers will receive specialized medical and physiological evaluation is a direct advantage to the climber. A long term advantage is the contribution that the results of these testing programs will make to future mountain climbing expeditions. A good knowledge of the limits and scope of the problem faced is essential to the successful traverse of that problem as an obstacle.

Institute personnel contributing to this brochure were:

A. Davidson, V. Hoeman and H. Marshall (mountaineers); P. R. Morrison, J. Nava, J. H. Petajan and G. Schumacher (Physiologists, scientists). We are indebted to T. Moore, S. M. Tenney and B. Washburn for helful review and suggestions.

Cover shows Mt. McKinley across Chena Ridge looking south from the Institute of Arctic Biolgy and the Arctic Health Research Laboratory on the University of Alaska's West Ridge Campus.

1 April 1976

SUBJECT: Mount McKinley

The following information is provided to you for your utilization in preparation for the 1976 Air Rescue Mount McKinley Expedition.

Mount McKinley (20,320 feet) is the highest mountain in North America. Rising almost 3,000 feet above its highest nearby neighbor, it is the undisputed monarch of the Alaska Range. The range has only been "circumnavigated" once (in 1903) and traversed only twice--south to north in 1954 and east to west in 1963.

The longest glaciers, except the muldrow (41 miles), are therefore all on the southern side of the range; The Kahiltna (46 miles), the Ruth (38 miles), a huge unnamed glacier south of Mount Foraker (34 miles), the Eldridge (30 miles) and the Tokositna (26 miles). The rain fall at Talkeetna, 60 miles south of the range, averages about 30-35 inches per year, and at Wonder Lake barely a third of this amount. The weather on the northern approaches to these mountains is therefore much better than that on the coastal side.

Grass extends to an altitude of about 4,000 feet and the treeline is only 2,000 feet high. Even mosses are only found in any profusion up to about 5,500 feet, and then only on the warm, sunny south-exposed slopes. Snow falls down to an elevation of about 4,000 feet in every month of the year, giving McKinley one of the world's greatest vertical extents of snow-cover (16,000 feet).

Despite the fact that the ascent of Mount McKinley via its two classic routes--the Muldrow and the West Buttress--involves no major technical difficulties for experienced climbers, the peak presents some remarkable qualities which must be understood and remembered by all those, experienced or inexperienced, who may wish to climb it.

Firstly, McKinley is a subarctic mountain. It is 35 degrees of latitude further north than Everest (63° 04' 10.5"), and this 2,400 mile difference results in a climate around its summit which may well present the most severe year-round average of any non-Polar spot on earth. The warmest night encountered at the 18,000 foot camp in July on our 1942 expedition was 18° below zero Fahrenheit and minimums to -24°. were recorded on this trip at the same spot. In May and June, temperatures frequently drop to 30 below zero or colder and are often accompanied with furious winds of 100 or more miles per hour from the southwest (prevailing) or northwest, making the peak a veritable inferno of evil weather. In recently describing Denali Pass, the 18,200 foot notch between McKinley's twin peaks, I have been frequently tempted to repeat Sir John Hunt's vivid words on Everest's famous South Col:

"A desert of rock and ice where the wind rules supreme." I know of no spot where wind and temperature can be more powerfully combined than on McKinley's upper ridges--and I am referring to the summer months. The upper reaches of this peak in the great winter storms present conditions almost indescribably fiendish. The summit has only been reached once in midwinter and then, in perfect weather at 7 p.m. on March 1, 1967, the thermometer stood at -58°F. giving just a slight clue as to what is to be found up there in bad winter weather!

Although McKinley's weather can at times be almost unbelievably gentle, even at the summit, one must be prepared for superlative extremes even in midsummer whenever one climbs above the 12,000-foot level.

Secondly, Mt. McKinley is a big isolated mountain. It rises out of level lowlands to north and south which are but 2,000 and 1,000 feet high respectively, making it one of the world's greatest isolated uplifts out of low country. The steep mass of the peak itself rises 15,000 feet from its base at the head of Ruth Glacier on the south and almost exactly the same from Peters Glacier on the north. McKinley's two most effective bulwarks against the climber over the years have been its distance from the road on the north (29 miles) and the railroad on the south (45 miles)--(both airline distances, far, far less than the winding walking routes require)--and the regulations of the government which for many years prohibited ski-plane landings or airdrop of supplies anywhere on the peak or its approaches, except by scientific expeditions. Since 1956 the progressive relaxing of these regulations has resulted in an ever-increasing stream of ascent--two through 1940, six through 1950, 70 through 1960 and 89 through 1970! McKinley, indeed, is a wilderness mountain. The shortest no less than 36 miles of walking one way, and not taking into account any relaying or zigzagging--all in addition to 18,500 vertical feet of climbing!

Last, but not least, Mount McKinley presents a remarkable cross section of subarctic terrain as well as climate, forcing a rather careful selection of clothing and equipment. Again referring to the Muldrow Route, the climber leaves the highway near Wonder Lake and starts walking through beautiful spruce forest with moss underfoot and trees 50 feet or more high. The temperature here is almost constantly above freezing in the summer, day and night, and frequently rises over 80 above zero (F.) on clear calm June, July and August days. One must soon plunge waist deep into a wide icy glacial torrent (the McKinley River) after which several miles of swampy mosquito-ridden treeless uplands must be crossed--really hot in clear summer weather, cold and miserable if it is rainy and windy. Thence, eight miles of barren rocky valley lead to the edge of lower Muldrow Glacier at McGonagall Pass (5,720 feet). Here, the almost crevassless ice is deeply covered with wet slush in June, bare and excellent walking from July to September.

Temperatures range from 14 to 20° above zero on a clear summer night to at least 80°F. on a clear, hot summer day--but with typical alpine extremes of snow, sleet or icy rain in bad weather.

Next comes a belt of substantial crevasses from 7,000 to 10,000 feet altitude, where snow is always loose and deep except in the winter, and where the crevasses from, seemingly bottomless slush, and the hot midday

sun can be really exasperating and alpine at times,---------and although it is broad daylight all night in June and July, it only reaches a noonday altitude of 51° on the longest day of the year.

Almost constant dry-snow conditions are reached at the head of Muldrow Glacier below the great Harper Ice Fall at 11,000 feet. Melting does occur up to about 12,500 feet in warm mid summer weather, but extreme slush is passed around 10,000 feet and winter reigns the year-around above 14,000 feet.

At this 14,000-foot level an abrupt change in climate takes place. High winds (which are rare at lower altitudes during the summer) are frequent, and sub-zero (F) weather is encountered nearly every night. The snow above 14,500 feet is almost constantly hard and wind-packed, except after occasional windless July storms, and sub-zero temperatures occur day and night alike above 16,000 feet. I have never seen melting snow above 15,000 feet on Mount McKinley, except around rocks. The climate from 17,000 feet to the summit of the summit of the mountain is downright arctic at all times of year. In fact, the warmest that I have ever seen the thermometer in Denali Pass (18,200 feet) was +8° on a hot, calm, clear day in June, 1947. Storms up here appear rapidly and can be extremely violent, as will be described later. Even the most powerful and experienced alpinests must approach the upper part of McKinley with deep respect for its weather, even on the easiest climbing route.

Although the last few paragraphs have, in a way, resembled a climbing description of the Muldrow Route, they have basically been intended to show the great extremes of the weather and terrain that are encountered on this peak and for which it is justly renowned.

M C K I N L E Y ' S W E A T H E R

A clear understanding of Mount McKinley's weather can prove of great value to the climber. Unlike climbs in the Alps or the Rockies, it is impossible to have good weather throughout the entire ascent without incredible luck. The lower half or two-thirds of the peak may be climbed under almost any conditions if one is willing to put up with a certain amount of discomfort. On the other hand, the weather is king on the upper reaches of McKinley--all of your movements above 15,000 feet depend on good, or at least reasonable, weather. Few parties have experienced long spells of clear calm skies on McKinley and most other high Alaskan peaks. The best climbing strategy has always proved to be to maneuver one's party as high as humanly possible in bad or mediocre weather; then to move fast both up and down when the clear break comes. At least one competent party completely failed in the ascent by moving forward only in reasonably good weather. Their food, fuel, and patience gave out just above the halfway point! A disregard of the weather or a lack of knowledge of it can result in an infinite amount of unnecessary misery and possibly serious trouble or difficulty.

The weather on Mount McKinley follows two markedly different patterns: one, the succession of storms that pass over the peak; the other, the weather generated by the great mountain itself. This is typical of all high ranges of the world, but it is particularly pronounced on McKinley because the mountain rises, almost completely isolated, to an altitude of 20,320 feet out of level lowlands. It is also located only 130 miles from tidewater at the head of Cook Inlet and therefore receives, without the slightest obstruction, the full force of all the coastal storms which pass its way.

The big storms, except for an occasional northerly or northeasterly windstorm in the winter months, usually bring "warm" weather to the mountain. At 18,000 feet where we lived for three weeks in 1947, the average clear weather nightime temperatures were approximately 25° below zero Fahrenheit. During the southwesters this temperature rose to zero or on occasion even a bit higher.

These southwesters are preceded by theusual warnings of a warm front: high cirrus clouds and increasing winds. Usually about twelve hours pass from the time the first 30,000-foot cirrus streamer appears until the peak is actually enveloped in overcast and precipitation begins. Disturbances of this sort arrive slowly and methodically and are therefore of no great danger to the climber, despite their ultimate violence.

MCKINLEY ENJOYS VERY LITTLE REALLY CLEAR WEATHER.

It is generally agreed that the practical climbing season on McKinley begins in May, lasting through the end of July, however, it is during July itself that the conditions on the upper part of the mountain are mildest and most stable.

Most dangerous to the climber of all McKinley's storms are those created by the peak itself during the summer months. It is also likely to be relatively moist. If the wind aloft is reasonably brisk (20-50 miles per hours), this air, when it hits the peak and streams up, over and around it, creates a lenticular cloud-cap which rapidly varies in size and tendency to precipitate, depending upon the temperature and humidity of the air mass. Storms of this sort, while the entire region about the peak is cloudless, can appear or disappear with incredible swiftness (15-20 minutes) and often bring fierce blizzards of short duration.

These storms almost invariably clear away in the evening when the air around the mountain chills. Their unpredictable character makes them something constantly to be watched and respected by even the most experienced climber. A sound knowledge of this type of weather contributed directly to the success of our ascent of July 10, 1951. We reached an altitude of 18,200 feet at Denali Pass around noon, and saw that the peak above 18,500 feet was completely enveloped in a lenticular cirrus streamer. The lowlands below were clear except for a few scattered clouds--the normal fractocumulus and cumulus of fair weather. There was a 25-30 mile-per-hour westerly breeze and the temperature stood at zero in the sun.

We knew McKinley intimately and elected to go slowly ahead into the overcast, climbing "blind" for four hours to an altitude of 20,000 feet. We were certain that late in the afternoon this local storm would dissipate as soon as the sun became lower and the air began to chill. This did happen, and we reached the summit at 5 p.m. under beautiful conditions with scarcely a cloud anywhere.

Weather can be a powerful factor in the success of failure of any expedition to a peak higher than 14,000 feet situated in any latitude. And this is particularly true on a high subarctic peak. If one learns the local phenomena and watches their development closely, a knowledge of the weather can prove a highly valuable asset--one which is often essential to success, as we have repeatedly learned from experience on Mount McKinley. There is little doubt that a lack of appreciation of the length and violence of McKinley's storms, as well as the insidious effects of the lack of oxygen, were the two key factors leading to the great tragedy of July 1967, when seven young climbers lost their lives simultaniously in a great summer storm on the summit cone of the South Peak.

S U M M A R Y

The ascent of McKinley is a curious paradox. Under certain conditions it can be disarmingly easy, while under others it can be fiendishly difficult. It is just near enough to the higheay so that a strong, experienced party will someday make the round trip to the top in less than two weeks, given good breaks with the weather. Yet, it is far enough away and its weather so fickle and violent that even the most powerful group of climbers may be forced to take a month or more to make the ascent by the easiest route--or, indeed, fail - if weather and conditions do not cooperate properly.

The ascent of Mt. McKinley might well be described as a short polar expedition in three dimensions! This is a surprisingly fair appraisal of the Muldrow and West Buttress Routes -- routes which scarcely have more than 1000 of climbing more technical than on the Grands Mulets route on Mont Blanc, yet where the potential dangers of enormous snow-covered crevasses, bitter arctic cold, violent storms and 20,000' altitude make it a peak that must be approached with care and respect by even a strong group of climbers. The mere fact that, even with radio, rescue parties are a long, long way off should have a sobering effect on those who wish to take too many chances on McKinley. It is this lack of major technical difficulties which has repeatedly made the climb possible for parties with minimum mountain experience, but with a maximum of fortitude, care and persistence - particularly when the weather has been kind. In addition, it is this same technical simplicity which is certain to lure more and more groups onto this peak.