

BUILDING WITH LOGS

B. Allan Mackie

Prince George, B.C.

SILLOP HILL.
B. D. STANLEY

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by

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The axeman
in the twentieth century
displaying this determination
to find peace
and sanity
is [oined in history
to every pioneer
who set himself to carving
a homestead
in a new world.



Most Canadians think of themselves as natural born axemen. Indeed, they are entitled to this image even though they may *never* have seen a tree felled, for it is still possible in this country to develop with pride these skills which were practised by our surprisingly recent ancestors.

This book is intended to encourage those Canadians who would leave the suburban reservations to live part of their lives at peace with nature, and those who admire solid timber construction as one of the strongest, most durable, and beautiful building forms known.

There are three prime reasons for using logs in house construction. First, a log house is one of the most aesthetically satisfying in which to live. Logs bring the natural world back into our lives in a way that is becoming more necessary than ever to our survival as thoughtful human beings. There is a deep sense of peace, living in a house made of natural trees. No stripped, chipped, cooked, treated, compressed, or otherwise manufactured product of industrial technology can give you, the builder, such an awareness of each living tree as it once stood. You will remember long after your house is built, whether its trees had few limbs or many because of where it grew. You'll know how it looked as it fell to the ground. A scar may remind you of the day the logs were skidded to the building site. The length of time it took you to build will be recorded in the faint darkening of the rising logs as they became drier and less easy to peel. You will remember a log that chased you down the skids or one that humped its back before it was subdued and fitted into place. The scrubbing, oiling, and perhaps varnishing will warm the colours and highlight the textures of the new walls — revealing curves, limb lines, perhaps the lacework of bark beetles or the clawmarks of a bear — all signs of nature to be saved and treasured. In the end, the family that builds a log house knows their home as a work of art. They can savour it as no other.

None but the log house provides its own sweet incense of sap and resin. Solid timber walls have an acoustic quality that makes music sound richer. Harsh household clatter does not strike, echo, and bounce as they do from plaster surfaces. Logs also can absorb nails, to hold up a picture or a fireplace poker, concealing the holes again if, later, the nails are removed. The natural brown tones are restful to the eye. Above all, there is a quality of snug security in the fortress-thick walls. Perhaps this comes from log construction being old in Canadian history. A log building ties time honoured tradition into our sometimes uncertain today's, giving a sense of continuity and stability that is unusual in modern housing.

The second advantage of log construction is durability. With a good foundation to protect the wood from the composting urge of earth, and a wide overhang to shelter against rain and snow soakings, the log building will rival concrete in its long life. Very few frame structures can compare, and these only when the timber framing approaches the stoutness of logs. In style, the log house has an amazing durability. Pressures of fashion have never succeeded in making the log house look outdated. It is in timeless good taste even in a most simple building as well as in the dramatic designs in logwork coming into being. This harmony is due entirely to the logs themselves, the most appropriate building material in any landscape.

Third: log construction is the only contemporary construction method which enables an individual to exchange his own labour and ingenuity, rather than cash or a mortgage debt, for a home to be proud of. Building with logs does require hard work but it is pleasant and healthy work and, if undertaken at a pace that permits full appreciation of the undertaking as a once in a lifetime experience, it is work not at all beyond the strength of most families. The house sketched on the back cover of this book was built at Southbank in 1953 for a total cash outlay of two hundred dollars. The only purchased items were glass, roofing, spar varnish, and rough lumber. The rest was accomplished with a good deal of innovating, trading, scrounging, and neighbourly cooperation — all activities which are still permissible in many parts of this country.

But where the use of logs requires not only the purchase and delivery of all materials but also the hiring of the builders, the log house will be as costly as frame or masonry construction. This should not deter the family able to afford what pleases them most. And savings will occur both in the centuries-long durability and in the very low cost of building maintenance.

Let us begin the discussion of how to build with logs, knowing it to be a discussion, for there are always different ways to do each task. Every axeman will find many new answers of his own. This is part of the craft. It is what helps to make each house unique ... a work of art.

THE TREE, AS BUNDING MATERIAL

I am going to ask that this discussion of log building begin with a close look at the tree as it stands, before a hand is laid upon it. Many of us, have two hang-ups: agrarian and cultural. In the agrarian past, the tree was an enemy. It constantly threatened to invade fields and pastures, or it already was using land which could otherwise provide food crops. Farmers waged a constant war to eradicate them from the land and, in the past, it was more of an equal battle. But with the bulldozer, the farmer gained the upper hand. In fact, the agrarian instinct is so strong in most people, we rushed headlong about the landscape toppling trees, heaping them up, burning them as we would burn rubbish. Our enthusiasm carried us ever onward, < tearing and breaking forest lands which should never have been expected to grow anything else but timber. But our ancient urge for land is not easy to curb. And I often wonder if this urge is, in fact, resurfacing now as a thoughtless, unconscious contempt for the tree. That is one hang-up. The other one I've called cultural for, with industrial technology, we've been shaped to believe in a finished product. It is difficult for us to accept the possibility that one of life's necessities could be found, perfect, in nature. A few years ago, they began to put wax on turnips, for example. They were thought to look better, when they arrived at the grocery store. And so it is that some people approach the building of a log house with the idea that the tree as it stands is not quite right, that it should have (as a longtime logger said to me) "some kind of finish". A close look at the tree's physical properties will help overcome both these hang-ups. First, the body of the tree is composed of hollow cells, either tube-like or brick-shaped, packed closely together. Under a microscope, they resemble a honeycomb. When the tree is felled and the vital fluids have dried, these tiny airpockets seal — becoming a most peile< My insulated building material. This is why a log house remains so cool during the summer, and why it takes many days to chill off if left for a few days during the winter. It is also why sounds are absorbed, and why music floats softly through the rooms of a log house. Vapour control is taken care of, too; household moisture is not absorbed to any degree by the log and yet, any which does exist will find its way out as it always did, via the log ends. Therefore, the tree as it exists in nature is already an almost perfect building material. As for "finish", if the tree is peeled carefully, so that only the bark is removed but no gouging, scarring, or scratching of the wood itself is allowed to occur, the wood will dry to the sort of satiny finish that invites hands to stroke it, fully to appreciate the smoothness. If, next, the log is washed free of dirt, allowed to dry again, and given a single oiling with boiled linseed oil, the surface becomes not only satin-smooth but waterproof. I know of no sawn or cut wood of any kind, capable of this — and it is my opinion that this tree is the product of millions of years of tree-trial, proven successful. It is for us to grant the tree the respect it deserves.

THE TREE, AS A DOOMED SPECIES

It is also good to keep in mind, as we approach the study of solid timber construction, that the log builder is in an enviable position where he can preserve what is being harvested of an endangered species. During the summer of 1972, I travelled from one end of Canada to the other and kept asking, "Where are the trees?" And good, big trees are hard to find even in the regions of the legendary lumberjack. The forests are vanishing. For trees as a species are not equipped to survive the competition with machinery, with human encroachment, with chemicals, and above all, with the need for profit to supply assembly-line employment. A tree is far too much like the buffalo, the trumpeter swan, the sea otter, and the whole sweet-natured peaceful legion of beings who brought swift cash to the men who thought such plenty could never end. Like all those others, now almost extinct, the tree has no self-defence. It is slow-growing. If a tree can be brought from seed to harvest in only 50 years, that is considered a triumph of forest technology; it usually takes 100 to 150 years for the trees we are now harvesting to have grown. Even so, we tend to forget that in a virgin forest, trees continued for perhaps 500 years to reach maximum growth so large we can scarcely comprehend the yellowing photos of them. And that harvest was in full swing less than a century ago, in British Columbia. So, the tree as we know it, and use it, is incapable of maintaining the pressure, obviously. And the tree is slow to reproduce. Unlike herbs which can reach maturity and spread seed within a single season, trees must have many seasons to mature before reproduction is possible. There is no point expecting human nature to change. People will demand employment, rather than work, and government will be led to ask industry to provide employment — with natural resources as the raw

material from which **are** made the finished products — the newsprint, the wrapping paper and cartons, the toilet tissue and paper towels, the **fake** wallboard, and the lumber. The man who can take the equivalent of one logging truck load of timber and spend his labour shaping and fitting a log house, does have the personal satisfaction of performing creative work and a valuable product is the result. His work will live on, preserving for future generations the beauty and strength of the logs we still have. This, I realized when visiting the Convent of the Grey Nuns in St. Boniface, this fine, four storey building of hand-hewn oak stands as perhaps the only reminder the nation has of these oaks as they once grew on the banks of the Red River in Manitoba. It seemed to me a national tragedy, as I travelled this land of giant timbers, finding only such fragments of the mighty chapter of architectural history that might have been written in Canada had the timbers been valued for the unique and beautiful building materials

that they are. Below are four photographs provided by the Provincial Archives of British Columbia, showing the woods in the vicinity of Vancouver as the white man first found them. There were no power saws in those days, either.

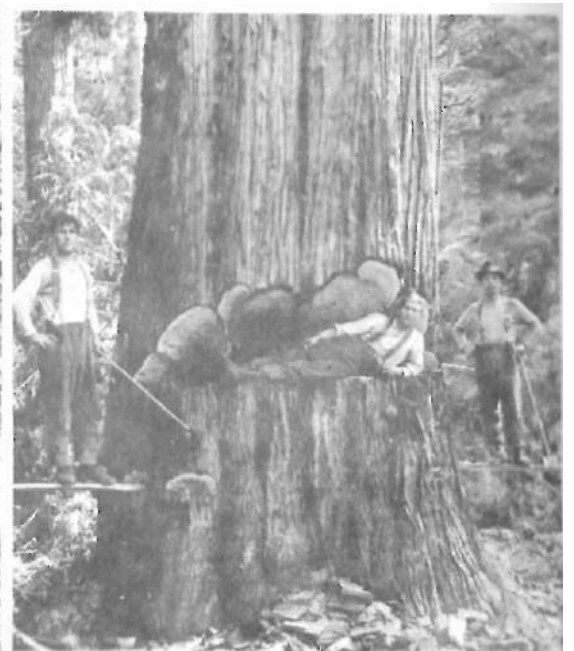


Left: August 1895. This Douglas Fir stood 417 feet tall with a clear 300 feet to its first limbs. The circumference at the base was 77 feet, or a butt diameter of 25 feet.

Lower left: A western Red Cedar of similar size. Note the two-man crosscut saw held across the top of the stump and the springboards on which the men stood to work in order to be able to saw above the wide flare of the roots.

Centre: A stand of Douglas Fir, about 1900.

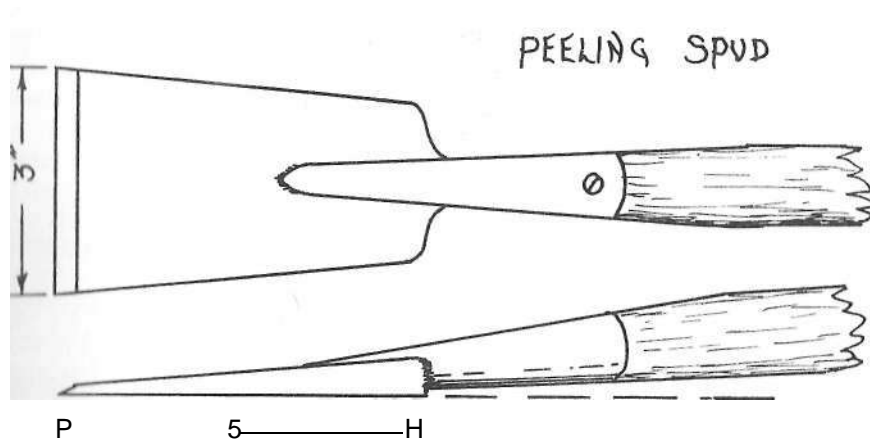
Lower Right: Putting the undercut in a western Red Cedar at Myrtle Point, B. C., about 1924. It requires a high level of axemanship to put in this kind of an undercut entirely with an axe, these falling axes having long, narrow bits and handles up to 4 feet in length. The back cut would be put in with a crosscut saw.



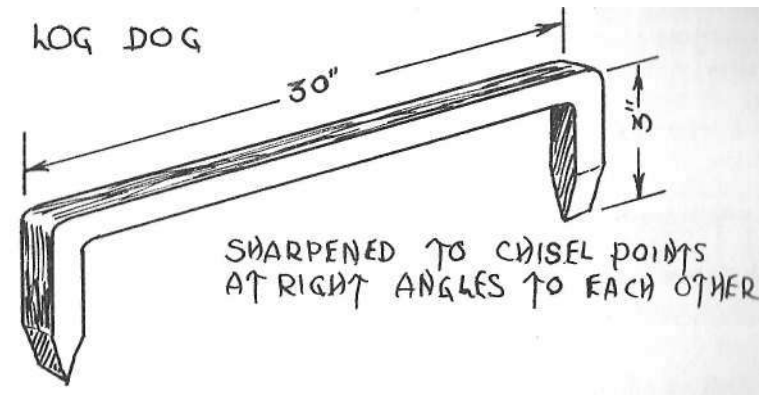
Tools

The tie hackers and shake splitters who moved into the bush to work the winter not so very many years ago were said to have had their sawmills on their backs.. This was true, inasmuch as they could build their own accommodation for the winter with the tools they could carry double bitted axe, a broad axe, a crosscut saw or framesaw, an auger bit (the handle to be made in the woods), plus a piece of sheet metal for the stove and a small packet of shingle nails. This, along with a bedroll and a few days' supply of groceries, set a man up in business.

Conditions in the woods have changed greatly ... for loggers. But for the lone woodsman, the basic tools — with the exception of the power saw — have changed little. Because your building will be larger and of a more permanent nature, there is need for a somewhat expanded list of tools. The most important of these, in addition to a basic set of carpenter's tools, is a log scribe, a peeling spud, and a pair of log dogs.



Logs can be peeled with an axe or a spade but a peeling spud is best. This can be made from a piece of truck spring with a socket welded to it of a size to take a regular spade handle. The spud should be about 3 inches wide and heavy enough to cut off small knots.



Log dogs can be made by the same welder. Use 3/4" square steel about 36" long. Sharpen each end to a chisel point and bond about 3" of each end down. These, when driven into the building at one end and into the log on which you are working at the other end, will hold it firmly in place. A smaller and lighter pair of log dogs, about 12 or 14" long, are also very handy.

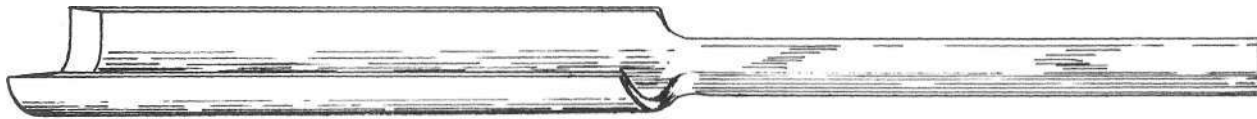
The tool that can do the most for you is a power saw and in spite of the fact that it is noisy, smoky, and dangerous it must be recommended for its speed and tremendous versatility. I don't really favour one brand of power saw above another because almost any saw gives good service if it is looked after correctly. But in general a very big saw is too dangerous to handle in high or awkward places on a building, and the itty billy saws developed for Cheechakos are, in spite of the manufacturers' claims, good for nothing. Use a moderate sized saw of 4 to 4.5 cubic inch displacement and with a relatively high cutting speed and a bar length of 16 to 20 inches. The shorter bar is good for working on the building but the longer bar is needed for falling trees. Some saws have a high noise characteristic and, out of respect for your eardrums, should be avoided. I recommend, as protection against the noise and against sawdust flying into the eyes, the wearing of a crash helmet with full plastic screen across the face.

To look after a power saw, observe two rules: mix the gas and oil properly and keep the chain sharp, properly tensioned, and well oiled. Most power saws require a 16 to 1 mix (16 parts gas to 1 part oil) mixed by measuring 3 gallons of gas into a 5 gallon can, then pouring 1 quart of oil into 1 gallon of gas in a separate can, stirring and shaking this mixture until the oil is well suspended before it is added to the previous 3 gallons making a total of 4 gallons of mix. If all the oil was not mixed, pour a little back into the smaller can and stir again. When pouring this into the gas tank of the saw, use a strainer funnel. The chain filing and tensioning is best done according to the manufacturer's directions for each saw. The riling is to do it faithfully.

Axes are, to a large extent, a matter of personal preference. I use 3~3/4 lb. double bitted axes because I like them. One has the helve cut off to 16" and the other is the full 36" but shaved down until it is limber enough to ease the shock of impact on timber. Many people prefer a single bitted axe because it is safer. A heavy axe head (4 to 4~1/4 lbs.) with a very short handle is most useful for notching.

Axes should be kept sharp. File into the bit, "cuffing" the file with the axe. A good handle on the file prevents cuts if the file slips. Start filing a distance back from the edge and work out to the edge. This will keep the blade slim and parabolic in shape. Too thin an edge will chip or bend, but an axe must be sharp as a dull axe can slip or glance off the wood.

The owner of a good 2 inch auger is lucky for this is not an easy tool to find. The only care it needs is protection of the edges from gravel, dirt, or nails. Grease it well before storage to prevent rust. In use, a hand auger should not be expected to bore through more than one log at a time. Unless it is very long, it will jam up with chips and, once taken out of the cut, it is hard to start again. Bridge augers will drill deeper, particularly if power driven. Holes may also be cut with a gouge type of chisel. This chisel has a long curved blade and is sharpened on the inside. It should have a heavy shank so it may be driven with a hammer. I first saw this type of drill among the tools used for making Red River carts, in the Duck Lake museum. Nowadays, as in the 1800's, this tool would have to be made by a blacksmith.



Gouge type of chisel
which could be used
for making round holes.

A good pair of scribes will be a great help. These can be made from a heavy pair of machinist's or tinsmith's dividers. They should be strong enough to be able to cut a good clear line in the log but handy enough to fit close to the log on the corners. They should have a way to set the distance firmly without danger of slipping. "Fin" type scribes can be made by a blacksmith and very good scribes of this kind can be made from a No. 4 coyote trap (which has the added advantage of keeping the trap from being any further danger to coyotes). Cut the eyes of the spring through at right angles to the spring so that they have a fishtail cutting edge. Heat and squeeze the spring to a sharper bend and put a keeper around it. In use, the cutting points are set at the desired distance with a small block of wood and the keeper is driven up tightly.

Good scribes — that is, ones which the builder himself finds efficient — are the key to perfectly fitted logs. Their helpfulness cannot be overestimated. Many types and designs of scribes have been made, generally by the individual who is to use them. So, just as a guide, I will include later a dimensioned diagram of the scribes which I have found to be most successful. They were made from an old power saw blade.

A broad axe is necessary if any hewing is to be done. As the name suggests, a broad axe has a wide cutting edge. The face side is flat and it is sharpened from the other side only, something like a chisel. Only a broad axe will make the straight faced cut for a relatively even planed surface. As these fine axes are no longer available from any supplier I know of, I am including (under the section on hewing) a dimensioned drawing so that a good blacksmith could make one.

Another helpful marking device is a chalk line. The kind that reels into a closed container filled with powdered chalk is good and can be obtained at any good hardware store.

An adze or a lip adze can be a useful tool but also a very dangerous one. Some builders use quite a variety of short handled adzes and axes — they can be handy but are not strictly necessary.

The builder will also need a peevie or cant hook to move logs, 200 to 300 feet of 3/4" polypropylene rope and a single shive snatch block.

This list of tools is sufficient to construct a log building.

In choosing a site for a log home, one thinks almost automatically of peaceful, wooded acres. Any home is more ideally situated on spacious, parklike grounds but such a setting is no more essential for a log building than for a stucco or siding structure. In fact, a well-built log townhouse will often become a landmark attracting many sightseers. A city lot is in no way a deterrent to building with logs although some trees seem necessary if the traditional link between house and forest is to be preserved.

Choosing a site for a log house should, therefore, be done just as for any home: for its personal appeal to the inhabitants, its convenience, its availability, and so on. However, I do not feel that a log dwelling should ever be subjected to the proximity of high-rises, shopping plazas, or high density traffic arteries. Rather, a long and quiet life should be planned. But if "progress" suddenly expropriates your city area, marking the houses for demolition, none but the log house can have its members number-coded, dismantled, and reassembled better than ever in a new location!

COSTS

The family hoping to live their lives at peace with nature should be free, independent, and in charge of their own destiny. To my mind, the family's land and shelter which is their own completely.

For this reason, I am opposed to the borrowing of mortgage money. Because so much advertising is available for persuading people to borrow, I mention here only a few points which only crop up when it is too late: the reasons why borrowing is to be avoided. Most borrowers are influenced by the argument that a loan will give them freedom. My premise is that borrowing destroys freedom.

First, prime mortgage money is loaned only to those people willing to live on the reservation. This is understandable if a system, such as a city, is needed to employ, tax, and manage our lives. The city works closely with the mortgage corporations to restrict and control housing so as to assure attractive profits on mortgage investments. In some respects, then, a mortgage is rather like an Indian Treaty inasmuch as freedom is replaced by a lifestyle which an authorized official decided would be better for people in general. Not being able to keep a horse or raise the family foodstuffs any longer, we take our treaty money to the company store. As the Indian people try to tell us, the full costs are not simply cash. There is a high cost in pride, initiative, and the creativity which gives health to a family and to a nation. Once we become dependent we are at the mercy of a supplier.

A family determined to live outside city limits can certainly find a money-lender, though not Central Mortgage and Housing Corporation, to mortgage their land and their future home. But the interest rates will be higher, starting at about the usual bank loan rate and going up. And in order to qualify, the rural family too must prove itself to be plugged into the system in such a way as to be receiving treaty money on a steady basis, preferably month by month and to an acceptable level. The lender is entirely justified in demanding such proof for if that family is merely self-sufficient but has no extra cash this is bad news for him.

The second disadvantage of borrowing money is that the mortgage company will also dictate a highly stereotyped interior floorplan. For example, a small house is taboo even if it is being built for a single person. Three bedrooms are almost mandatory, as the president of a local construction firm discovered when he applied for mortgage funds to build a one-bedroom home for himself and his wife. His application was refused. "We preferred a very large living room and an extra large dining room," he said, "we enjoy entertaining. We simply don't need more than one bedroom." So he built the house with his own funds, the way it pleased him. Unless conditions change, anyone who rejects the many limited concepts imposed upon borrowers under the terms of a restricted building covenant will simply have to go it alone. A more beautiful, human city could well be a result.

The third disadvantage is the purely cash expense of a mortgage. The best C.M.&H.C. mortgage cost $\frac{1}{2}$ % interest when I bought a new house in Prince George in the summer of 1971. To give an idea of the interest costs only, this means that a small loan of \$10,000 if repaid faultlessly at \$ 100 a month for 16 years would result in a total cost of \$19,274.88. But there are other costs.. Conveyancing, insurance, mortgage insurance, and taxes. When I sold my \$22,000 house after a year, having paid \$186.34 each month, I found that the principal had been reduced by only \$80.00! thinking a bookkeeping error had occurred, I had it checked. "No, there's no error, Mr. Mackie, but you must realize that only \$7.00 of your \$186.34 is applied against the principal." Sensing my profound gloom (certainly not at Canada Permanent Trust Company in particular, but at the whole desperate situation in general), he hastened to cheer me up: "Next month, it would've gone up to \$7.05!"

The fourth and possibly the most disturbing aspect of borrowing mortgage funds is that even prime mortgages are being drawn up for only 5-year terms, which is only a fraction of the total repayment period. Even a small child knows enough to cry "Not fair!" if his partner tries to change the rules partway along a game. In the mortgage field, it suggests a future so uncertain that even the dominion government cannot face or control it. It leaves the borrower, at the end of 5 years, with only two options: to refinance through the same mortgage company if possible and under whatever new rules they demand; or, to find the money elsewhere to pay off the balance in full. This latter exercise is one which I believe is best undertaken right at the outset of any proposed building project.

Before construction is considered, all possibilities should be explored for going it alone. Perhaps a year's leave of absence from paid employment would result in a debt-free house and enormous longterm savings. Or perhaps weekend and evening work might provide a small guest cottage in which the family could spend the first year. If only a small amount of money is available, I would again point out the house on the back cover of this book which cost \$200 to move into. We did own the land and, from it, took our trees. The most beautiful of roofing, cedar shakes, can be cut in the Prince George area from free wood. The finest of flooring can be hewn, at no cost, from poplar and birch. A few temporary discomforts while a family lives in a small house are not as harmful as the constant anxiety and fear of losing the home if one's health or job fails. In fact, temporary discomforts of this nature deserve a better name — involvement, perhaps.

Aim above all to buy the homesite outright in order to own completely whatever is built, grown, and created thereon. This is the key to freedom. It may also be the key to survival. That Canadians should ever have to worry as to how they can acquire enough land for a home is to me a nightmare. As it is, to obtain a homesite without going into debt is not an easy task. A city lot in Prince George costs about \$7,000. Crown lands come right up to the city limits but most of the territory belongs to foreign pulp and mining companies. Crowding has resulted in Canadians competing, not so much with each other, but with U.S. citizens having more cash. Americans have bid up the prices on private properties just as has happened in the art and antique stores, so that Canadians can no longer readily afford to enjoy what is theirs. But hard, determined shopping will find some land that can be paid for in full. And hard, determined study will hopefully find a way of protecting for Canadians the land that they need. For only with land of your own can you truly hope to live in your home at peace with nature. A mortgage company might offer to do it all for you, yes; but in my opinion if they must dictate the size and shape of the house, its location, the family lifestyle with regard to employment, and the quality of your neighbourhood, this is a price too high to consider.

THE BLUEPRINT

Many people ask me for log house designs and floor plans. I am obliged to tell them that log house floorplans are really no different from any other floorplan. Housing is very personal, and planning should be a matter of individual study and choice. But insofar as special care must be taken in some construction details when using logs, I shall mention here some general characteristics to keep in mind when preparing the working drawings.

A square building, for example, is certainly the easiest shape for the novice to try first. But if the floorplan calls for a rectangle of two short and two long walls, they can be kept level by using logs of an average mean diameter — that is, the midpoint diameter of the two short logs should be approximately the same as the midpoint diameter of the long ones.

A house plan showing one long wall might prove difficult if the available timber is either short or extremely tapered. In this case, the plan might be altered slightly to give that wall a jog, halfway along, thus permitting the use of two short logs instead of one long one. This does create additional axework but it also creates additional interest as well as giving a much more professional appearance than if the logs showed extreme taper. Another solution might be sought in the method of building. Extremely long walls are built by using the French Canadian method of piece-en-piece construction. The Royal Canadian Legion hall was built at Fort St. James in 1971 by this method, as was the old Hudson's post in 1806. Jasper Park Lodge has some massive buildings constructed in this manner.

Floor to ceiling windows are something to ponder well before including in the log house. I do not feel right about cutting entirely through a wall. I enjoy the visible interlocking and binding of the members. But with careful attention to structural support, such windows are possible.

A vital consideration in the houseplan is to allow for the fact that the logs will shrink and settle, bedding more and more firmly together for about two years or more. Each log will shrink approximately 1/2". A tall wall will settle more in total than does a less tall one. Therefore, it is essential that space be allowed above doors, windows, and partitions so that as the logs settle they will not be forced out of position or get a hangup.

The electrical wiring layout must be detailed completely in the drawingboard stage, too, as the wires must be inserted and concealed in the respective logs as the building progresses.

With these few factors in mind, however, it is possible to adapt almost any houseplan to the use of logs. Certainly the builder need never limit himself to a "log cabin" stereotype. Good design, be it traditional or highly imaginative, will, however, take into account that log is most natural material and should be used in association with other natural materials. For this reason, I prefer to see either log or slab partitions, plank floors and ceilings and doors, shake roofing, and so on, rather than highly manufactured materials. Also, logs seem to look best close to the ground rather than on a tall basement foundation. If a lower storey or basement must be largely above ground, let it be of rock so that the house may appear to have grown from the site rather than to have been imposed upon the lot or sinking into it. In fact, let the site be considered as part of the houseplan both inside and out. Too often a pleasant view cannot be seen when a simple reversal of all or part of a floorplan would have placed a big window in plain sight. Or a dining room may be slightly altered so as to open onto a grove of firs for outdoor eating. Before the working drawings are finalized, these changes are easily made. Exterior design is more difficult but also rewarding. About all one can say is to strive for the best way of blending the house into the natural contours of the landscape. An evening's reading of the architectural philosophy of Arthur Erickson will help a great deal.

PLANNING A GOOD HOME

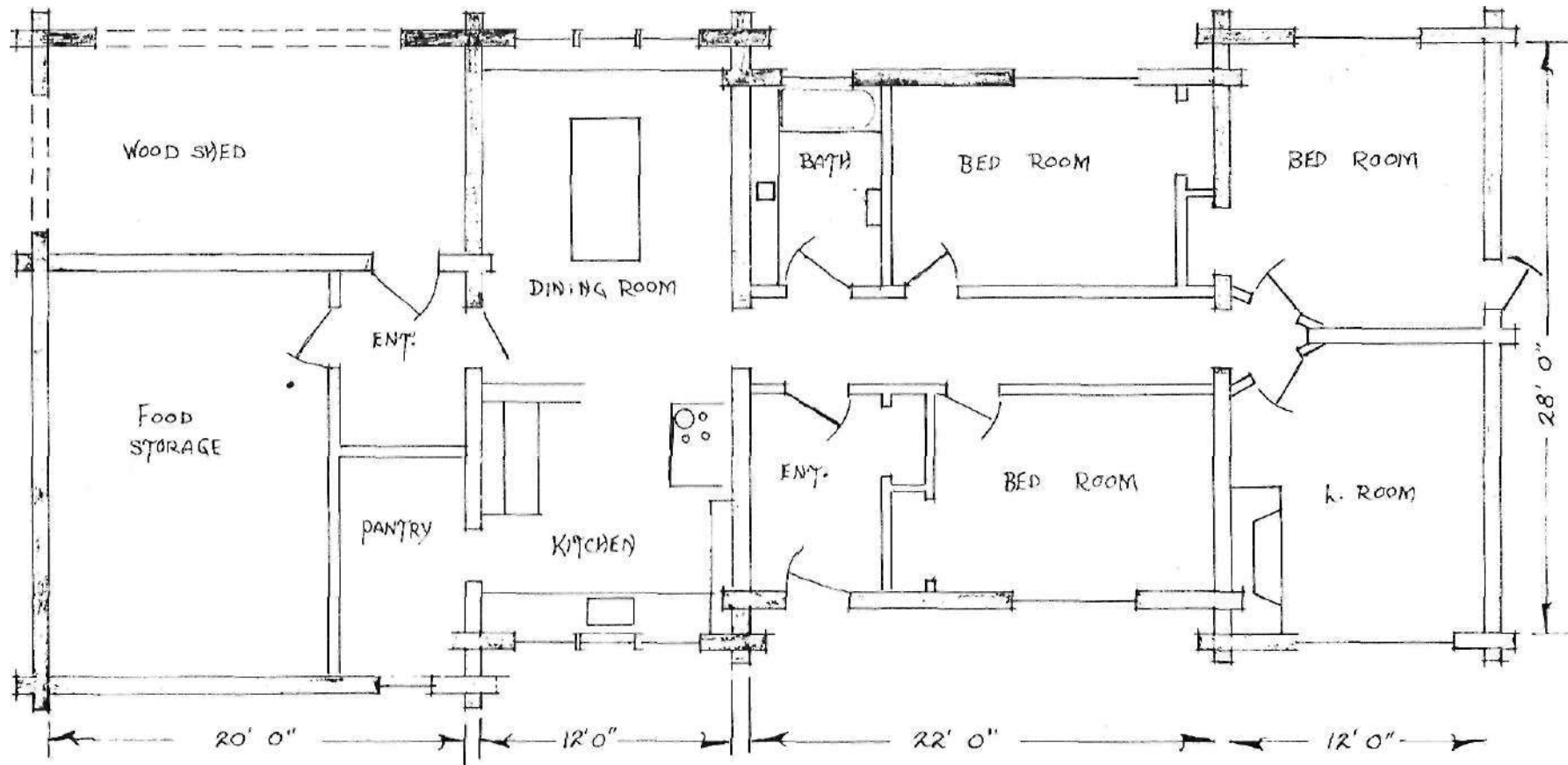
Consider, at all times, who you are building for. So often, houses are built for the wrong reasons: for assembly line efficiency, to create employment, to impress the passerby and, sometimes, I suspect, to use the new and ever more distasteful products of technology such as simulated woodgrain wallboard. I deplore the building of a house for its so called resale value, a contradiction in the meaning of home, but this is a big stick which both mortgage and real estate firms hold over the heads of the public. But let a log house come up for sale and, as one real estate agent told me, the phone rings off the wall with enquiries. So it seems to me that people are not fooled for long. A log house is the oldest in our cultural tradition and if it was planned to give a certain family maximum personal pleasure, my guess is that it becomes more desirable, not less, to a buyer if by some misfortune you must ever put it up for sale.

So plan to meet your personal needs and feelings. Discarding the stratagems intended to line us all up in rows, looking and behaving all alike, your task is to see the function and purpose of a good home. Sketch, discuss, measure, read, investigate, analyse. It is not impossible that you might come to understand that your personal concept of pleasing space is one large room. If so, take courage: Erickson lives in just such a house with a blank wall turned to the street.

Perhaps the best form of help I can offer, at this point, is simply to show how two of our own homes developed and why.

THE SILLOEP HILL RANCH HOUSE

The home sketched on the front cover of this book and shown in the houseplan below provides an example of planning to meet unusual personal needs. There was no blueprint on the market for a house which could function smoothly for six months at a stretch without a trip to a grocery store. Your lifestyle may not (unless you are extremely fortunate) require this kind of housing but whatever the particular needs may be, the methods of enquiry, testing, and planning will be similar. Uppermost in our minds was the idea that this house should serve its occupants rather than the occupants serving the house by constant repairs, polishing, painting, or even by submitting our free movement to any avoidable inconvenience.



SCALE 1/2" = 1'

B.A-MACKIE SB

The Silloep Hill Ranch, which my wife and I homesteaded in 1959, required a house adapted to the climate, the isolation, and the scenery of this area of north-central British Columbia. Like most people intending to build, we first looked at books of houseplans. But even after special enquiries to CM&H, public libraries, and UBC, we found no plans for a true working ranch house. All plans were variations of the city bungalow with larger houses simply running to luxury rooms for formal entertainment or recreation rather than to work space or food storage. We knew that no compact kitchen could shelve all our provisions any more than dinette space could accommodate a branding crew. Nor did we anticipate any formal entertaining, our visitors arriving unannounced by ones, twos, or a family group. The university librarians worked diligently but were able to send us only generalized information as to how to judge the efficiency of a kitchen (quite helpful) plus their good wishes. As homesteaders, my wife and I had no choice but to research and develop our own houseplan. Once having done so, I recommend it to anyone hoping for a home to be more than the standard cubicles in which we eat, sleep, and watch television.

The key to all the unusual features of the Silloep Hill houseplan was its isolation. We undertook the homesteading of new country in the belief that solitude is a privilege. But we felt that the adequate provisioning and smooth functioning of the household were essential to the fullest appreciation of this idyllic life. Thus, the Silloep Hill house is large, to ensure that it served generously its functions as home, school and office — virtually everything — to a family of four. All supplies including firewood were stored under the ranch house roof. This convenience, plus a complete absence of steps would, we hoped, prevent our having to depart for "easier" living in our old age.

Isolation dictated massive food storage areas. Isolation also made more subtle demands such as providing room for the whole family to work comfortably together indoors. It also indicated that, if we were to avoid irritations now and then, there should be a room where each member of the family could pursue work or study completely uninterrupted. And so that isolation need not mean boredom, we arranged for all possible viewing of the horizon and Nadina Mountain. These were the basic modifications.

Climate, we thought, indicated that entry halls should be incorporated into both the front and back door entries so as to afford double-door protection from cold. The back entrance was further incorporated into the woodshed, permitting severely mudded boots to be kicked off, coats to be doffed, or snow brushed off quite comfortably before even a door was opened. The kitchen was central, its long walls protected. We called this room our fortress and I built two bunks as window seats into the dining end of the kitchen so that no blizzard or furnace failure could catch us without an answer. The climate turned out to be milder than expected but these plans made the house all the more comfortable.

In the final plan, some conventional rooms had shrunk while others expanded enormously. For example, our living room dwindled to a retreat measuring 12x14, suitable for private conversation or reading. As its purpose was restfulness, it faced away from the exciting sweep of mountain scenery and looked, instead, onto trees and quiet pastures. This usually had to be explained to guests who, if they were city people, asked three standard questions: why didn't you build your house right on the public road instead of two miles in? why is your house so big? and why doesn't your living room face the view? Peace, peace, peace ... that's why.

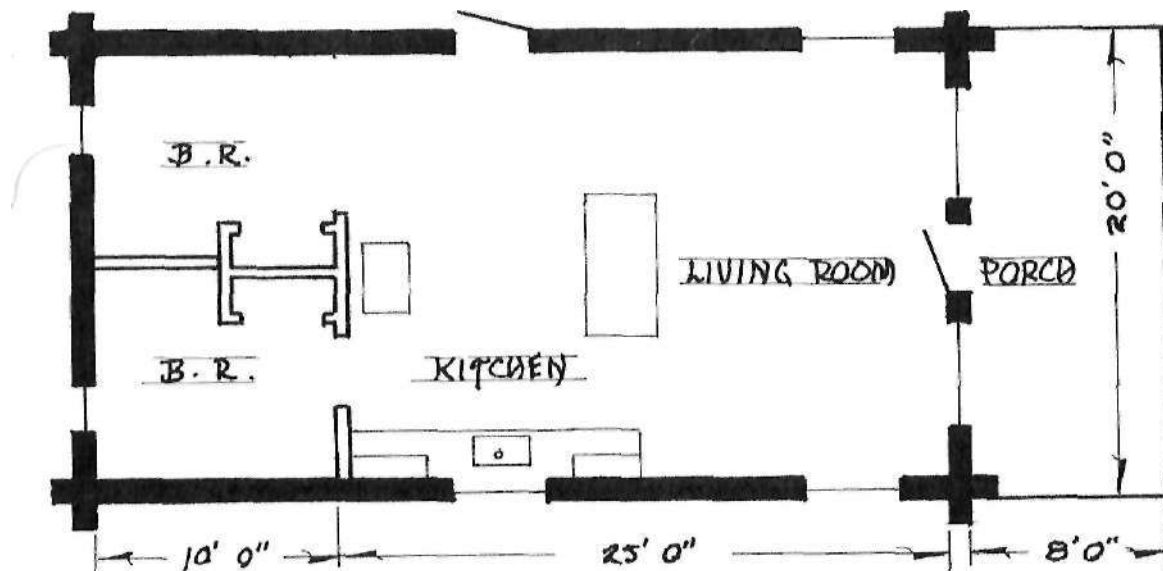
Our kitchen was naturally the room which expanded. The main room was 12x28 with three adjoining units: a pantry for all dry food storage, a double-walled rootcellar for all the vegetables and canned goods, plus a woodshed. In the kitchen itself, my wife could be cooking, the children could play, and I could be mending a saddle all at the same time and comfortably. Visitors to any ranch head straight for the kitchen, usually having travelled far they are cold, hungry, weary. In this big room they could warm their hands over the kitchen stove or relax at the dining table while coffee or a meal was being prepared. It's an unhappy cook who, living in isolation, is denied these welcome social contacts because of a "compact" kitchen.

How did we know the size of rooms needed? Our method of developing the room sizes involved 1) observing certain old ranch houses, some of which were extremely comfortable and efficient; 2) from imagining ourselves into the blueprint and visualizing entire sequences of indoor activity; 3) from using bits of cardboard, drawn to scale, to represent our tables, chairs, beds, shuffling these on the houseplan to get

a surprisingly clear idea of how work and play would feel in the spaces we had arranged.

Personal planning pays many rewards. "Efficiency is one. Not content with having storage for food and fuel, we saw ways to make the longterm handling of these items much easier. Simply by enlarging all doors, I could run a wheelbarrow of vegetables right from the garden indoors to the storage bins in the rootcellar. Twice a day, a wheeled woodbox also went gliding through this door to take on a load of wood without our ever having to carry any in our arms. Another great help was a bake counter tailored to hold all the cooking equipment and materials within arm's reach, with an appropriate counter height eliminating the strain of kneading bread dough or stirring cake batter. (The small children also made good use of this low counter.) In this bake centre, at my wife's request, I installed no cupboard doors as I had once counted the number of times she opened and closed them (141) in the preparation of a simple afternoon tea. In fact, any door or partition must nowadays account for itself in solid terms before it is allowed into our home. If it serves no purpose such as warmth or privacy, these clearly are not doors or partitions — they are merely obstacles.

By the time we moved into the Silloep Hill ranch house, we had thought it all out so carefully we knew exactly where every item belonged and how to get right to work. It was a good home, to which we look forward to returning. Meantime, as world conditions changed so rapidly, we felt that our school age children deserved the chance to participate fully in both worlds, the "outside" one as well as our own wilderness. So when I say that planning is a very personal thing, a matter of individual need and feeling, I can perhaps best explain this by saying that I would not build that house in exactly the same way today, as I did in 1959. Conditions have changed. It is no longer so isolated in the Owen Lake region. We have changed. We are cured of wanting a large herd of beautiful cattle only to see them shipped to slaughter. And furthermore, society has changed. In 1959 there was much in the public attitude that made us willing to forego a great deal that society offered. But today, although formal entertaining may never be a feature of our wilderness, we do find so much that is hopeful in the general outlook especially among young people that we would expect to incorporate much of the "outside" world — visitors, guests, students, workers — into a good home there now.



THE SOUTHBANK HOUSE AT FRANCOIS LAKE

The house sketched on the back cover and shown at left in its floorplan, might be used to illustrate that a house need be neither expensive nor complicated in order to be a good home. It is essentially a single large room, the function and purpose of which was to permit all possible viewing of the beautiful lake at the doorstep. Minimum partitions separated the two sleeping areas so that the big windows facing north could be seen from anywhere in the house at all times. This meant that by merely lifting our heads off the pillow at night we might be rewarded by seeing the northern lights sweeping the sky or the dawn's pink light flooding the ice. I never saw a door or a partition to equal such sights.

The Southbank house might be considered more romantic than practical unless viewed in terms of cash alone. It cost us little more than the price of a month's rent in an average city apartment. Or, for that matter, scarcely more than a month's mortgage payment.

Finally, to assist the person trying for the first time to express his own needs in housing, I would offer reassurance derived from Arthur Erickson: that there is really no such thing as "good design" or "pleasing design" ... a good, pleasing building is concerned with meaning, and "the strength and simplicity of a building is achieved through clarity of meaning." ¹

ACQUISITION OF LOGS

There are three ways to obtain a sufficient number of straight logs of uniform and suitable size: from your own property, from Crown land, or from a commercial log producer. Ideally you will have the trees on your own property, although great care should be taken that the woods surrounding your new home will not be depleted.

To cut trees from Crown lands, a Free Use permit is applied for through the nearest B.C. Forest Service office. Under Section 25 of the Forest Act, this permit is readily issued without charge to a Canadian citizen who is a settler engaged in agriculture, or who holds a Free Miner's licence, and who does not have sufficient timber on his own land for the purpose specified in the permit. This Free Use permit is a privilege maintained from the past and should be jealously guarded. A Special Use permit may also be obtained and the payment of a reasonable stumpage and royalty is required for the trees cut. Often a forest district will have a Special Sale area set up, on which if it is possible to harvest fence posts, cedar shake blocks, firewood, or whatever material the area offers. Suitable house logs may sometimes be obtained here. But as Crown lands come more and more under the control of large corporations, the individual is forced to get his logs from a commercial producer. If you are obliged to do this, you will undoubtedly find several logging companies listed in the telephone directory. After talking to a few of them, you'll be able to tell which operator can or will supply properly selected logs delivered to the building site. Large logging companies may not be interested in sorting out ideal trees. Smaller outfits are usually more obliging this way.

To buy logs, you need only specify the lengths, sizes, and species, as well as the number required. Purchased logs will be scaled and charged for by the cunit (100 cubic feet). A log 28 feet long, 9" at the top and 12" at the butt will contain 17 cubic feet or about 5 logs per cunit. Prices will vary among the individual logging operators depending upon weather conditions and how busy they are. Prices can also vary with the same operator, from time to time, according to the kind of area he happens to be logging in. You can expect to pay more if it is at all difficult for them to sort out the required number of good house logs. When placing your order, be generous in your estimates of the log lengths. Allow at least 5 or 6 feet beyond the actual wall length to provide ample material for finishing the log ends and also to overcome the danger of a too-short log coming off the walls when it is being rolled across the building, and one end of it falling into the interior.

SELECTION OF LOGS

If the building is to be about 30 feet square, suitable logs might be 14 to 16 inches at the butt. So if you are selecting the trees yourself, mark those which measure between 42 and 48 inches in girth. As a general rule, small buildings require smaller logs; large buildings seem to demand larger ones. If in doubt, always err on the side of bigness for not only do the logs shrink but the added size is helpful in several ways — thicker and therefore better insulated walls, fewer notches to cut, a more solid appearance and, of course, superior strength.

To judge if a tree is straight, first look at it from a distance of about 100 feet and from two sides, at right angles to each other. If no sweep or crook can be seen in the required length, move *tn* close and sight up the tree. It must be very straight to appear so from this angle. Few trees are perfectly straight and, in my opinion as a builder, this is good. I admire an axeman courageous enough to use big, rugged trees. Such logs have great beauty, similar to that achieved in a roof of rough, hand split shakes. This should be considered in comparison to some

machine peeled logs which become so perfectly alike as to seem like a package of drinking straws. The use of massive and imperfectly shaped logs requires maximum skill on the part of the builder. Such a house should be highly valued not only for its strength of character and dramatic naturalness, but also for the craftsmanship which it requires. The beginner, however, is well advised to use the straightest trees available.

SPECIES

Almost any species of tree that grows to log size can be made into a building. But some, because of their characteristic form, durability, or colour are more desirable than others. In British Columbia, in loose order of preference, the most suitable trees for logs, floor joists, rafters, and shakes are cedar or Douglas fir, pine, spruce, hemlock, and balsam. After seeing hewn poplar buildings in Saskatchewan still standing true and square after almost a century, I would hesitate to say that even these trees, so unappreciated here, are not worthy of consideration. But the Western Red Cedar is very durable and young trees have very good form for log building. These will be difficult to find in most areas and very expensive to buy since they are always in great demand as power poles. Douglas Fir is very strong and durable wood. The trees often have a distinct sweep. They make excellent rafters, joists, ridgepoles, as well as logs. Lodgepole Pine have excellent form and durability and are easy to cut and peel. Engelman Spruce is a white soft wood and not as durable as the others when exposed to weathering conditions. Kept dry, it is quite serviceable, generally is very straight, and is easy to work with. Western Hemlock has good form and is sufficiently durable if kept dry. It is difficult to find completely sound wood, however, since it is very susceptible to decay. Balsam is also a very soft wood and is subject to decay if not well protected. While suitable for building, it is not preferred.



HOW TO FALL A TREE

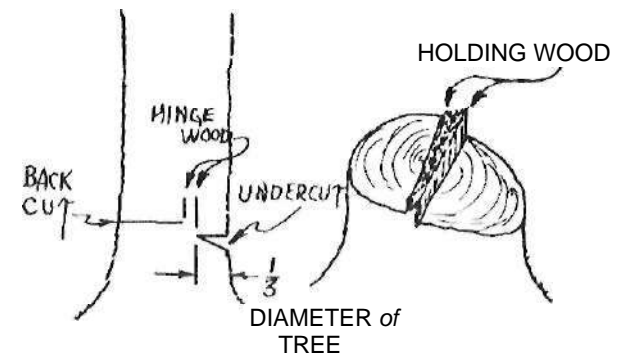
An early immigrant to this country was asked which way the tree he was chopping was expected to fall. "How should I know/' he replied indignantly, "I'm not a bloody prophet! " He must have been surprised when he learned he could indeed have influenced the outcome. The term "faller", rather than wood-cutter or some such name, does indicate where the skill is centred. Cutting through a tree seems simple enough. But to lay that tree safely on the ground, unspoiled and precisely where it is wanted, is the skill of one who cuts down trees.

The faller, first of all, determines the direction of the lean or weight of the tree in respect to the stump. Hopefully, it leans the same direction you want it to fall ... and you want it to fall where it can be tied onto at the top for skidding out. So if it leans not too heavily in some other direction, it may be wedged into the correct lean by driving a magnesium or plastic faller's wedge into the back cut at the right time and place. But if the tree is leaning too heavily in the wrong direction, you would be wise to fall it that way even though it will be harder to skid.

Next, check your "getaway" path ... a clear trail to a safe place (nearly always to one side and behind

the stump in respect to the direction of fall) where you're out of the way of the tree butt or any debris which may be thrown back.

To begin cutting, place the undercut on the side toward which you expect the tree to fall. The depth of the undercut should be $\frac{1}{4}$ to $\frac{1}{3}$ of the diameter of the tree. In height, the undercut should be $\frac{1}{3}$ the depth. Make this cut as close to the ground as possible. The backcut is put in next, parallel to the undercut and 1" to 2" higher on the tree. As soon as the saw blade is fully into the tree, a wedge may be placed in the cut to hold it open in case there has been any slight miscalculation as to which way the tree was leaning. Continue the back cut to within 1" of the undercut on moderately sized trees. This inch is called the "hinge wood".



The tree should begin to fall in the direction of the undercut. If it does not, check that the cuts are straight and true, then drive the wedge with the back of the axe more firmly into place, thus lifting the tree into the desired direction. On a stubborn tree, use two wedges. If the tree is leaning to one side of the chosen direction where the undercut has been placed, it is a good idea to leave a little extra thickness of hinge wood on the offside. This holding wood tends to direct the tree more accurately into the right path. Once the tree begins its fall, take the saw and make immediate use of your getaway path. If the saw sticks in the cut, leave it! Do not waste precious seconds tugging at it, when the saw will likely come to no harm and is replaceable, anyway. Watch the tree to the ground for, as it falls, it may brush other tree tops, bending them for a distance. As these tops swing back into position, they may throw limbs or chunks in your direction. These limbs are called "widowmakers" for good reason. Also, as the tree hits the ground the butt may recoil into the air, or other wood that it hits may fly up. Watch and anticipate these possibilities so that you may step clear. And if the tree comes to rest woven between others, be very cautious how you treat it. A heavily bound tree can possess tremendous power. Be in the clear when you make a release cut or, if it appears too dangerous, get an experienced friend to help. Finally, wear a hard hat. Never leave partly cut trees standing. Do not fall trees on a windy day. And never go out alone to fall timber. But otherwise, you could say there's nothing to it; it's easy as falling off a log.

WHEN TO CUT. PEELING AND STORAGE OF LOGS

Logs are best cut in winter when the sap is down in the tree. Logs may be skidded readily on the snow with less danger of mechanical damage. If this is not possible, cutting should be done in late fall or summer. Spring cutting is the least preferable. It is true that spring-cut logs peel much more readily but they are left too slick and plastic in appearance. A more serious disadvantage is that, being heavy with sap at this season, they are very susceptible to mildew and staining.

Logs cut in winter may be peeled anytime thereafter. Frozen logs are naturally more difficult to peel but not impossible. If the logs are not peeled until they are going to be placed on the building, they will have a different and I think more interesting appearance. If they have been completely dried before building begins, they settle less but are extremely hard and, therefore, difficult to chop and shape, and almost impossible to peel. Logs can be peeled with an axe, a shovel, a draw-knife, or a peeling spud. I prefer the peeling spud for most types of work. First cut the knots off close to the tree trunk. Then use the spud at an angle to the tree and with either the flat or bevelled side of the blade up, whichever is easier. Peeling is hard work and, for this reason, there are mechanical peelers on the market. The ones I have seen, I would not use. They are either miserable to operate or they mutilate the log so badly that its appearance makes me uncomfortable. Furthermore, mechanical peeling would deprive your friends and family of a great opportunity to help. Anyone can peel a log, or at least part of a log, and wives and children can do a great deal. It might also deprive you of the chance to work slowly and quietly of an evening getting to know your logs. Do not try for too perfect a job of peeling. You can only strive to retain some of the perfection naturally inherent in a tree.

Many people ask if logs should be seasoned before they are used. I have come to the conclusion that to stack logs for seasoning is to overlook their ability to take a "set" as they dry. They will, in fact, take a set according to how they are stacked. So it seems far better to put

the green logs up on the building where, as they dry and settle, they will take on the permanent set that the builder is working for. Ideally, the logs might be allowed to dry as walls without windows etc. Perhaps if a summer's spare time work got only the walls up and the roof on, so much the better if the building has to wait a few months before work goes forward again. As most of the drying takes place in the first year a tree is cut, most of the settling will occur in the first few months that green logs are up on the building. But waiting is not at all necessary. Even if the work goes straight ahead from start to finish, using green logs, settling will be no problem if adequate header space has been allowed above all doors, windows, and partitions.

If it is not possible to store the logs in the form of walls, perhaps because the foundation cannot be put in until spring, then they should be decked in tiers on two or more skids depending on the lengths. Skids are simply small logs laid on the ground or between layers. If logs are piled more than one tier high, the skids should be positioned directly over the ones below so that the weight of the upper logs will not bend the lower ones.

The only other consideration is checking. The method of building with a groove in the bottom of each log will localize checking to a large extent and this is perhaps another reason why logs, while still green, should be grooved and set on the building. If desired, however, logs may be washed with brine and protected from direct sunlight to avoid severe checking. Personally, I do not consider these small splits to be a problem and certainly not a disfigurement.

SAFETY

Much has been written about safety in general terms and I agree with most of it ... in particular, the point that safety is the responsibility of each individual. I choose this one because I know from experience that the farther you are removed from any hope of assistance, the fewer accidents occur. I think this is because you place the concern more squarely on your own shoulders, anticipating more fully the consequences of your movements. My wife and I spent six years with two small children in the Owen Lake area. We were 78 miles from the nearest doctor and 26 miles from a telephone, yet only twice came close to serious injury. The reason for this low incidence was, I believe, the added care used when it is not possible to call for help. Thus, accidents can be avoided — particularly if you understand the hazards. And there are a few hazards peculiar to working with logs. Here are some guidelines:

- Roll a log always toward the center of the building to work on it. A log near the edge could fall and take you with it.
- Stand outside the skids to adjust the angle of the log being raised. This way, if the rope comes loose or the skid slips, you are on the outside and clear to move to safety.
- "Don't stand in the bight!" This old logger's axiom means to never stand within the bend of a line under tension. Any failure in equipment when you are in this position places you in grave danger.
- Place sharp-edged tools well out of your way. If you plan to keep tools such as the peevee and auger up on the top log, make sure it is driven firmly into a position where it cannot fall. Allow nobody to work or watch from below you. When your axe is not in use, drive it into the wall one log down with the blade flush to the wall so you cannot possibly bump into it or step on it.
- Before starting to chop, always take a slow practice swing with your axe to ensure that there is no obstruction to the backswing and that a glancing blow will endanger no one.
- Wear shoes that afford a good grip on the logs. Hard-toed caulk boots would be the ones recommended by my father who, in the days of the Barr Colonists of which he was one, drove a broad-axe between his great toe and second toe, cutting his boot and two pairs of sox but not his skin. He took the rest of the day off, anyway.

The location of the building should be clearly in mind before any clearing is done. Avoid, if at all possible, the destructive bulldozer and prepare by hand only that area within the foundation line. If a basement must be dug, let it be done with the least possible disturbance.

Generally, one corner or one wall is chosen as a starting point for the building's position. Erect batter boards around three corners and at least 4 feet beyond the outside of the foundation line. The corner can be squared by using a triangle measuring in the proportion of 3 and 4 on the sides and 5 on the hypotenuse. That is, the front line may be marked 20 ft. (4x5 ft.) beyond the chosen corner, the side line marked at 15 ft. (3x5 ft) beyond where it crosses the corner location and adjusted until the hypotenuse measurement between them measures 25 ft.(5x5 ft.). The fourth batter boards may now be located by measurement and the squareness of the building checked by confirming that the diagonal measurements are within 1/4" of being equal. Other foundation lines may now be located easily by measurement.

In preparing to build, it is good to provide a comfortable campsite. A safe campfire area is important to prevent sparks from flying anywhere near the tinder dry chips created by the logwork. Perhaps some of the initial experiments with rockwork and concrete could take place at this cooking area. A plank table and benches are well worth the effort for the refreshment and relaxation they provide when the work gets heavy. And take time to build a well constructed outhouse well back from the water supply so that it may be of permanent use, for this humble establishment can greatly assist in reducing river and lake pollution. I wonder if, in a future and more enlightened age, the barbaric cubbyholes known today as bathrooms will be banished from the house entirely and human waste, along with leaves and vegetable peelings and so on, will be put to work producing methane gas. Methane, which is similar to propane, can provide light, heat, and the power to run cars. It is possible for a household to meet its own power needs in this way, issuing no further pollution of surrounding waterways or soil either through sewage systems or septic tanks. The Department of Agriculture has a certain amount of information on methods of producing methane gas. Or, for \$27.00 the instructions and drawings, plus a carburetor conversion device for switching a car onto methane fuel, can be obtained from:

Pennyrowden, Blackawton
Totnes, Devon
9.7 Dn., England

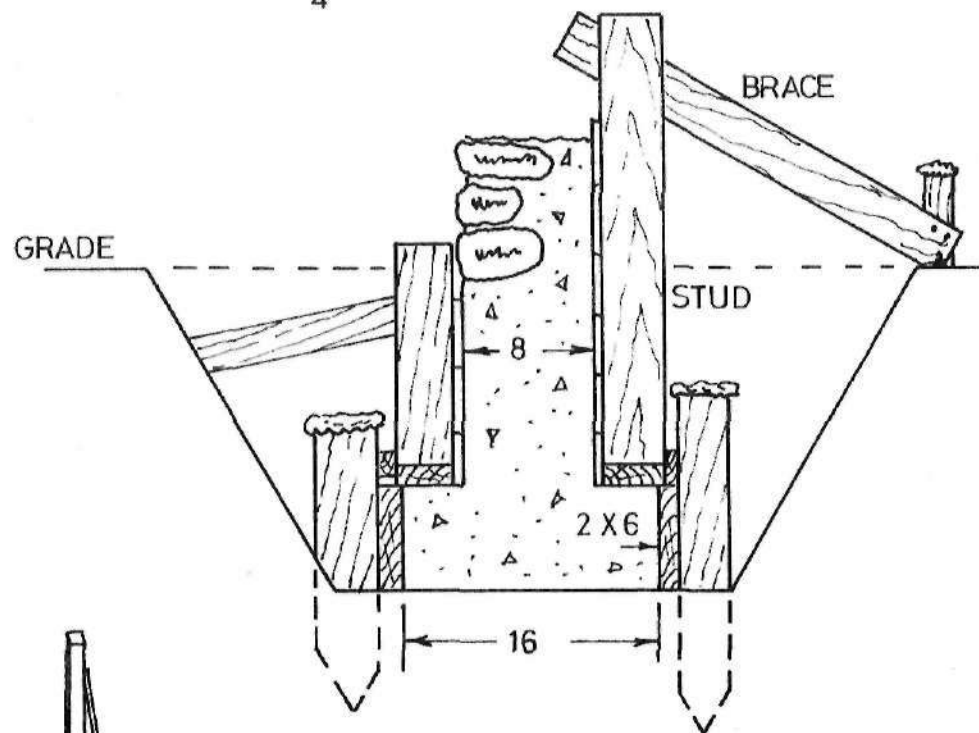
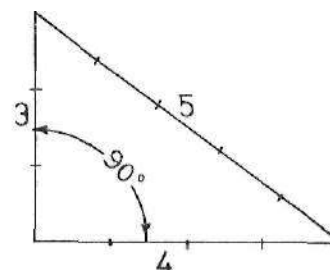
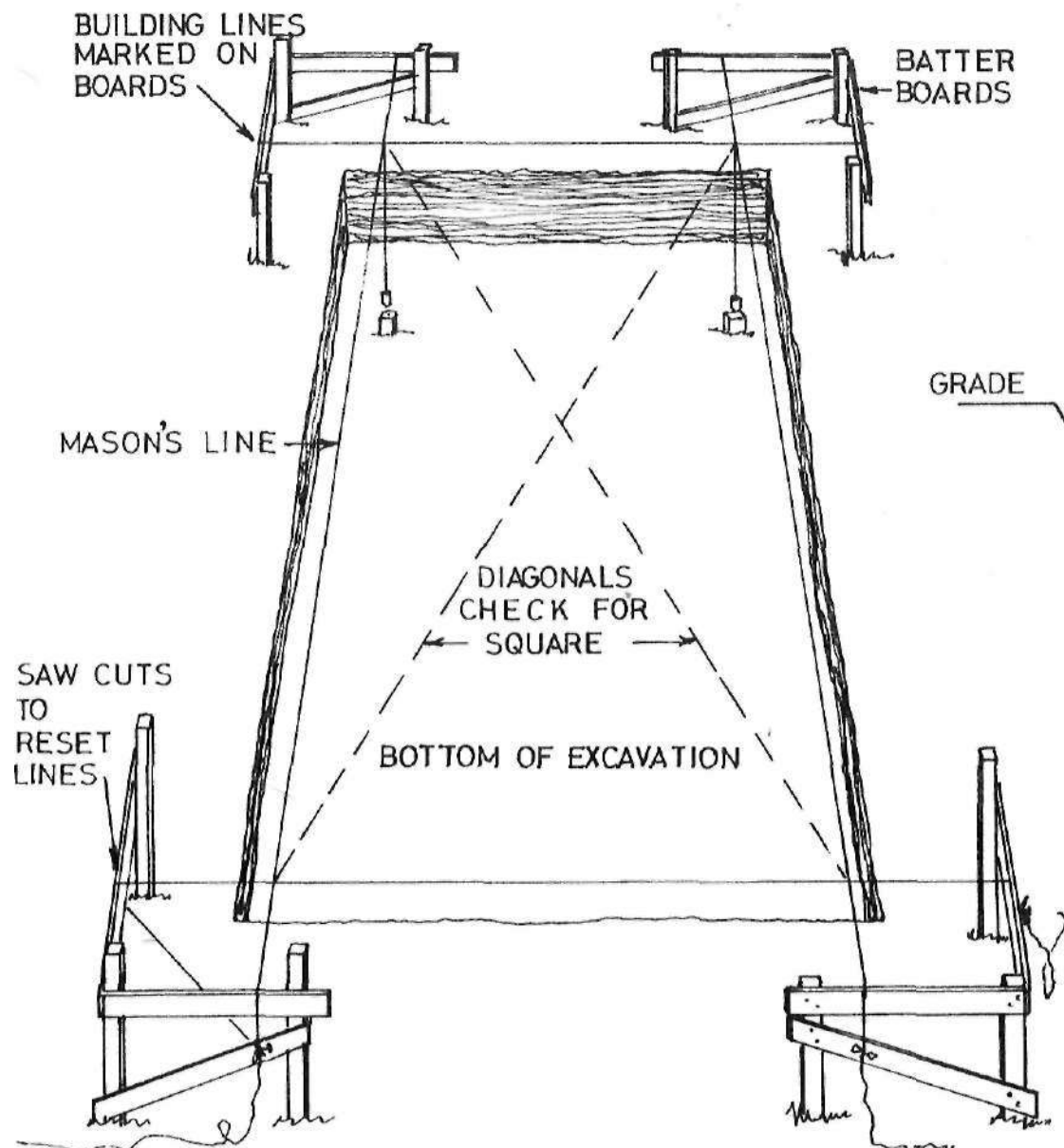
India, a nation having twice as many cows as people, is currently pioneering the active exploration of methane gas potential. Not only does India need the fuel and power, but they also need the resulting compost for its vital organic nutrients in agriculture. The Gobar (gobar meaning "cow dung" in the Hindi language) Gas Research Station has meticulously documented and recorded their experiments over the past 12 years and this information is available in two booklets (The Bio Gas Plant and Some Experiments with Bio Gas), the set costing \$5.00 from: Gobar Gas Research Station
Ajitmal, Etawah (U.P.)
India

FOUNDATIONS

Many early log buildings have fallen into disrepair largely because they were built without foundations. Those which were supported by a rock at each corner might have fared better had they not been banked up with earth and suffered in consequence. Certainly a cedar piling, a concrete pier, or a large rock at each corner is an adequate foundation, despite its simplicity, so long as earth and moisture are kept from touching the logs; warmth is no problem, even if the house is open under the floor, as long as the floor is properly insulated. But in the case of a family home or any log building where its maximum lifespan is to be realized, a good and complete foundation is important.

A foundation, to be good, need not be expensive or complicated. Though some plans and locations favour the use of a basement, I agree with Frank Lloyd Wright who considered basements to be expensive storage, poor root cellars, ugly, and unless they have good stairs and ample head room, a hazard to life and limb. In bygone days when hot air gravity furnaces were used, and perhaps because of poorly drained sites, it was felt that the footings had to be dug down fairly deep and that only a little extra depth would supply much added space in the form of a full basement. Thus, almost by default, basements came to be considered an essential part of housebuilding. But frost affects foundation walls only if they are poorly drained and the *need* for deep footings has been greatly exaggerated. On a well drained or sloping site, drain rock compacted around drain tile is sufficient footing, and concrete or masonry walls may be built directly upon this.

LOCATING BUILDING LINES



SECTION FOUNDATION

Low rockwork foundations are most complementary to log buildings. The inexperienced mason need not fear laying a rock faced wall if he places the inside half of the foundation form up first and fits stone on the outside only, filling in between the stones and the foundation form with concrete as the wall goes up. In the foundation of the Silloep Hill ranch house, shown at right, I used local rock, striving for an appearance of rough, artless solidness so that the finished foundation would be scarcely noticed.

A flat foundation is suggested for dry locations, to keep the building close to the ground. This may have a slab floor as illustrated in Fig. 5 on the opposite page, or a footing as in Figs. 1, 2, or 3. A generous overhang will keep moisture away from the sloped wall. End walls may have 4 or 5" extra height added to them to meet the bottom of the end logs which will be higher than the side logs.

A prepared mixture called masonry cement is available to use with sand and water to make a mortar suitable for stonework. However, if the wall is to be filled behind the rock with concrete, it is just as well to use concrete between the rocks. Readymix cement will not be possible for the small amounts you will work with at any one time. But if you are in doubt about the quality of the material otherwise available, get your sand and gravel from a supplier. Both sand and gravel must be clean. This is easily checked by half filling a glass jar with the sand or gravel to be used. Let it stand overnight after adding water and shaking thoroughly. The material will have settled in strata with the light organic material on top. If the top layer of mud or organic material is more than 1/8" thick the sand or gravel must be washed.



If it is not practical to obtain the use of a portable cement mixer, the job of mixing the cement can be done with a sweat board. This is a platform about 6 ft. square. A few shovels of coarse and fine aggregate are placed in the centre of the platform and cement added. A ratio of 5 to 1 is generally adequate unless the aggregate is very fine. Mix the dry material first, then add the least possible amount of clean water to obtain a workable mix. This is hard work and mixes should be small if used for rockwork as this material sets up quickly.

FIRST LOGS AND FLOOR JOISTS

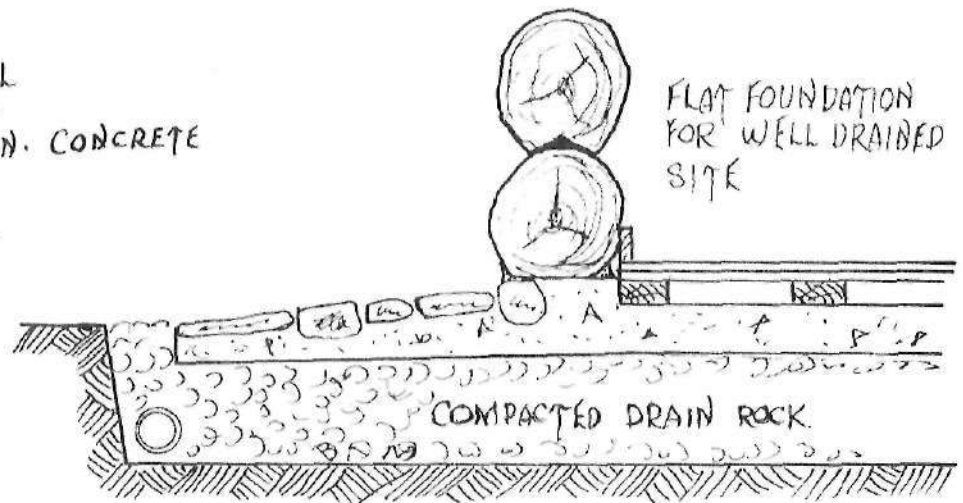
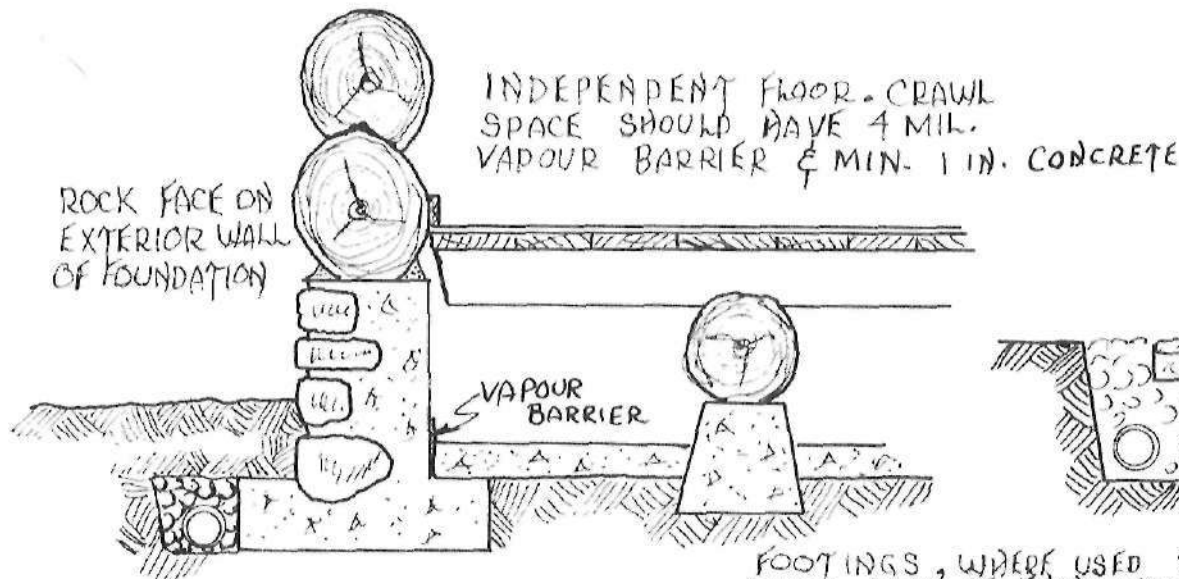
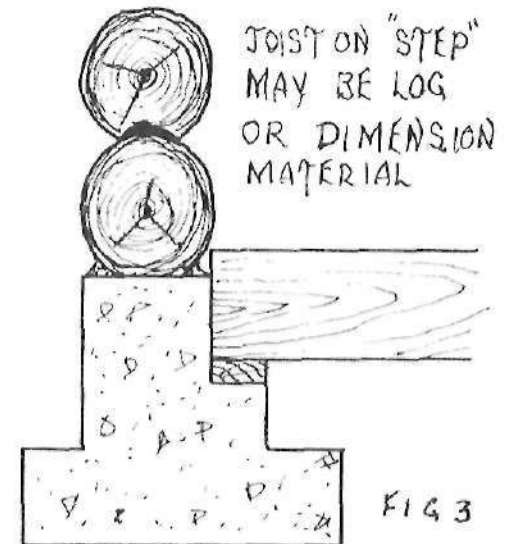
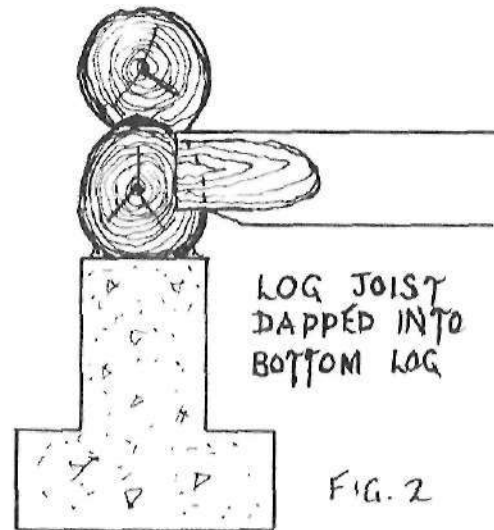
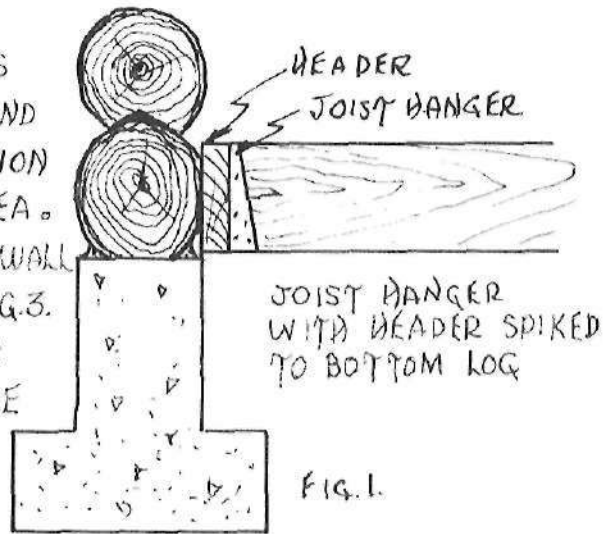
Concrete is considered to have obtained full strength in 28 days but it is not necessary to wait more than 5 days before placing the first logs. The first logs placed on the foundation will be on the side wall at right angles to the direction which the floor joists are to run. This will generally place them on the long side of the building. The butts should all face one way and the underside of each log is well flattened. Some builders have tried to put a 1" layer of concrete on the top of the foundation and sink the top log into it. This is very hard to do. It is perhaps better to grout concrete around the log after the building has gained a few rounds in height.

The next logs should now be placed at right angles to these first ones, with the butts again all one way as illustrated. If the foundation is not built up at the ends, this space can be grouted in when the side logs are done. Now begins the job of notching the corners of the logs soundly together. The notch shown in the illustration is a round notch, but one of the other styles might be preferred.

When the first round is in place, you can cut out the notches for the floor joists if they are to be of logs also. In this case, a chalk-line is run level the length of the side logs so as to locate the bottom bearing for the joists. Level points may be obtained by using a transparent garden hose filled with water and plugged at each end so that a few inches of air space remains; or use a line level. Individual notches may be cut at 2 ft. centers as illustrated; or a full length "step" may be cut with a power saw to give a bearing surface about 2 or 3" wide.

FOUNDATIONS

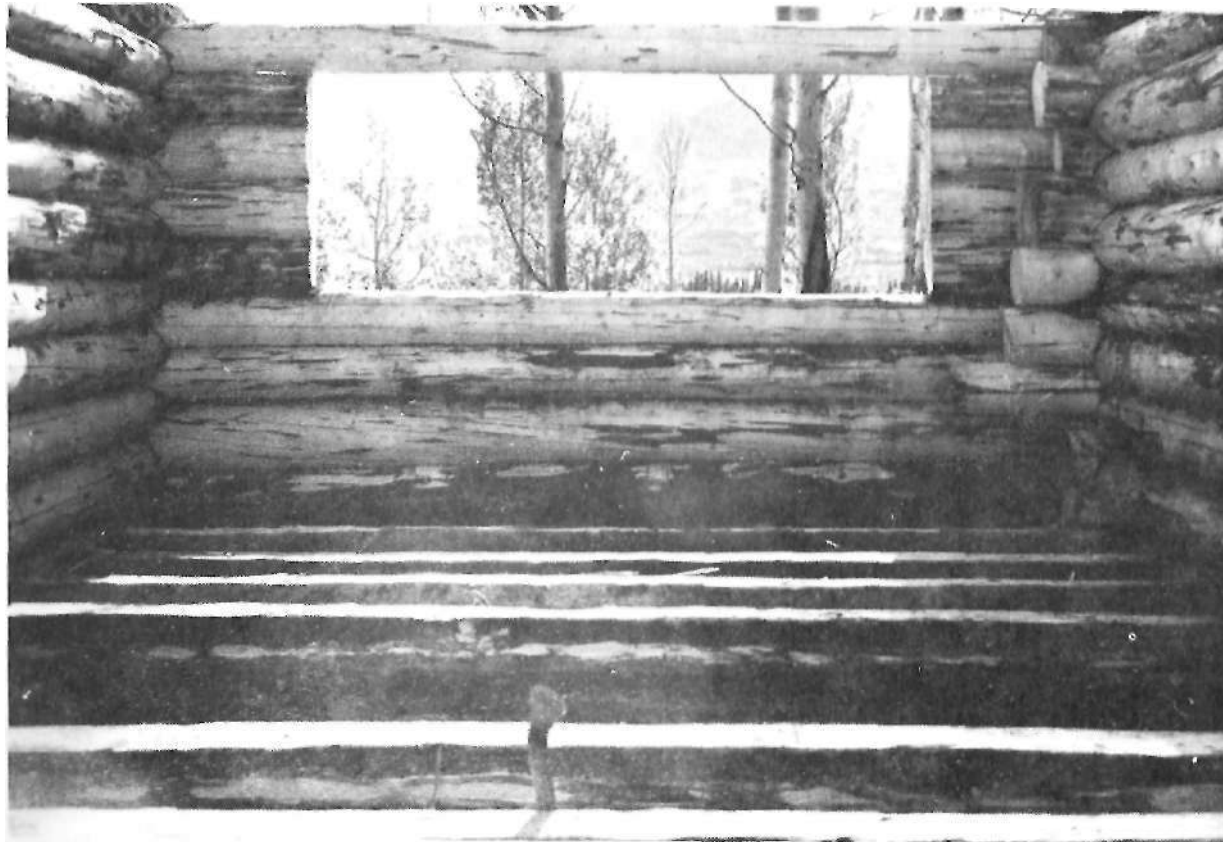
LOG BUILDINGS ARE HEAVY AND A 10" FOUNDATION IS A GOOD IDEA. FOUNDATION WALL SHOWN IN FIG. 3. IS OFTEN THE MOST SUITABLE



FOOTINGS, WHERE USED SHOULD BE TWICE WIDTH OF FOUNDATION WALL

The picture at right shows the start of a log building that was prebuilt for reassembly at a different location. The first two rounds are in place and notches cut to receive the floor joists.

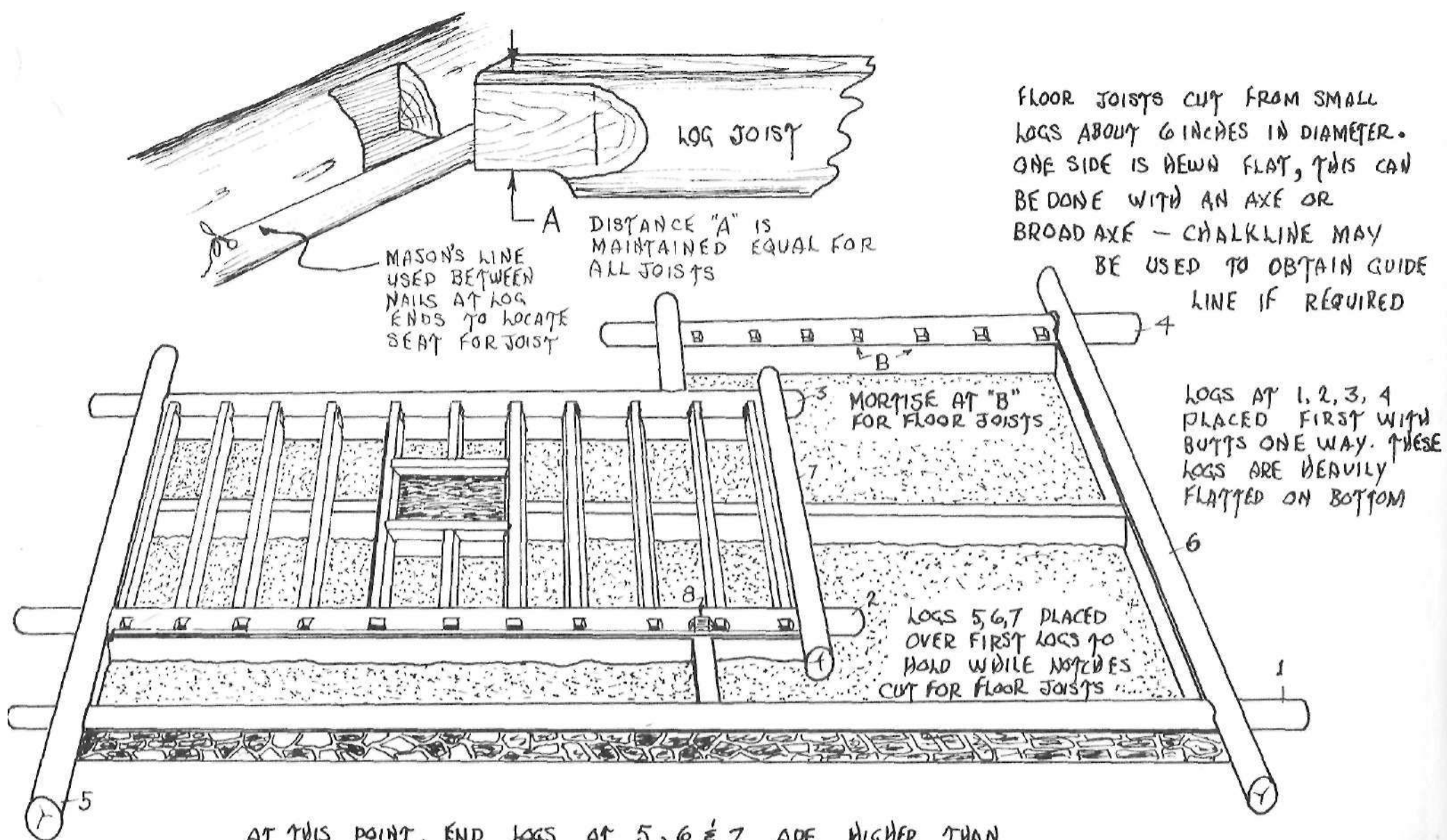
Below: the dining room end of the large Silloep Hill ranch house kitchen, with hewn log floor joists in place.



Log floor joists will be moderate sized logs of about 6 or 8" diameter. After they have been hewn to obtain a flat surface of at least 2" in width for the rough flooring, the joists may be cut to exact length. Next, flatten the under surface for a few inches back from the end to make the joist height equal for all joists. By placing the joists at opposite ends of the run first, all the rest can be aligned to a chalk-line stretched between them.

If the span of the floor joists is greater than 10 ft., the floor may spring slightly. Bridging could be put in but is difficult. It's best to run another log down the center for them to rest on, and which can be supported in several places. Any unevenness of the bottoms can be taken care of with wedges. When there is no basement, some builders block up each joist with a rock or concrete block and wedge.

Floor insulation is highly recommended. Run a length of mesh or chicken wire over the joists and "pocket" it down between the joists to support the insulation and protect it from damage. Plastic may also be used in this way.

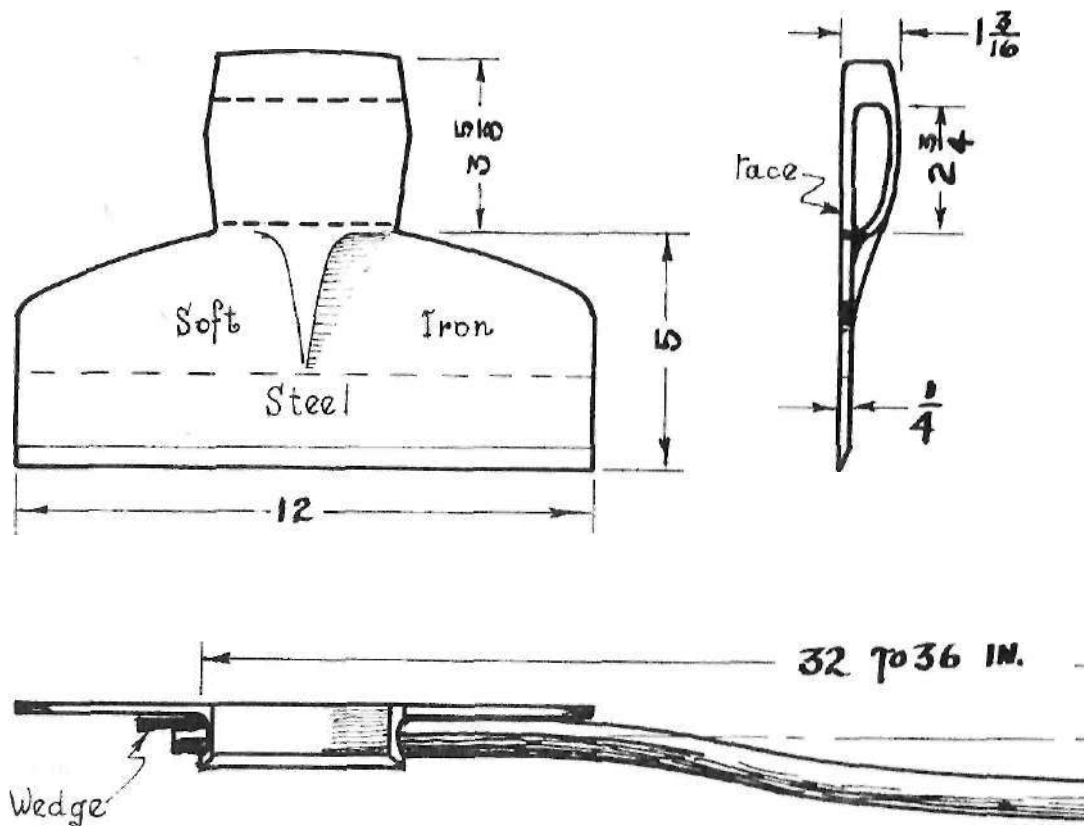


AT THIS POINT, END LOGS AT 5, 6 & 7 ARE HIGHER THAN SIDE LOGS. THIS MAY BE ANTICIPATED BY ADDING AN EXTRA 4 INCHES TO FOUNDATION HEIGHT OR BY FILLING AFTER. NOTCH AT 8 IS TO TAKE SHORT LOG - SEE BLIND JOINTS - PAGE 53

FIRST LOGS & FLOOR JOISTS

HEWING

In order to hew a log to serve as a floor joist, ceiling joist, or roof beam, it will be necessary to acquire a broad axe. No other axe will make the straight faced cut and smooth surface as well or as fast as the broad axe does. But because these are so difficult to obtain, I include here the dimensions so that a blacksmith can make one up. As mentioned under the heading of Tools, earlier, the broadaxe should be about 10 or 12 lbs. and should have a 36" offset helve.

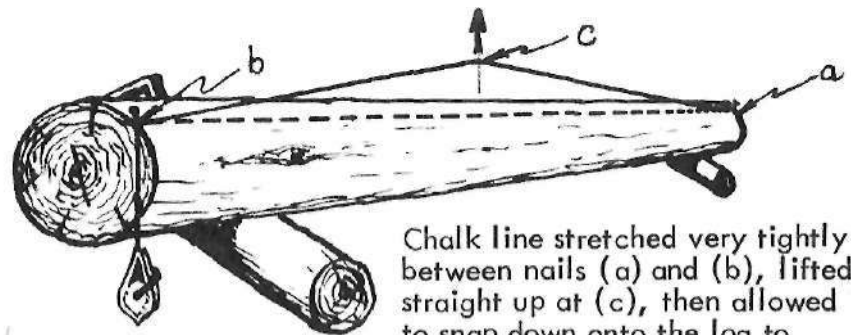


BROAD AXE

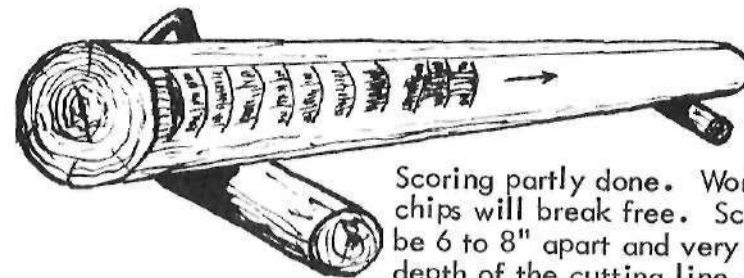
THE BROAD AXE ILLUSTRATED HERE IS FOR GENERAL PURPOSE WORK WITH SOFT WOOD. MANY DESIGN VARIATIONS HAVE BEEN MADE MOSTLY IN RESPECT TO SIZE AND WEIGHT. A HEWING AXE IS SHARPENED LIKE A CHISEL ON ONE SIDE ONLY, THE HANDLE IS OFF SET.

A scoring axe is also used in hewing. This is a single bitted axe which will weigh 5 to 7 lbs. One or two log dogs will be handy, with an 8 lb. sledge to drive them and, if the timber is very large, splitting wedges will be useful. The chalk line will be needed, too.

Place the log in the desired position, probably on a short log under each end and dog it to the short log. Snap a chalk line where the cut is to be made. To make a chalk line, first, drive a small nail into the end of the log at the point where the hewing line is to originate (a), as illustrated on the opposite page. Now stretch the line tightly to a second nail in a corresponding position (b) at the other end of the log. Loop one end of the chalk line around the nail (a), and tie it securely at the other end of the log to the nail (b), letting the container hang freely. With the chalk line now stretched in line with the hewing surface, simply lift it up — straight up — at about midpoint, and let it snap smartly back into place. It will inflict a perfect line of powdered chalk where it strikes. This should give a readily visible line to hew. This, actually, is "hewing the line".



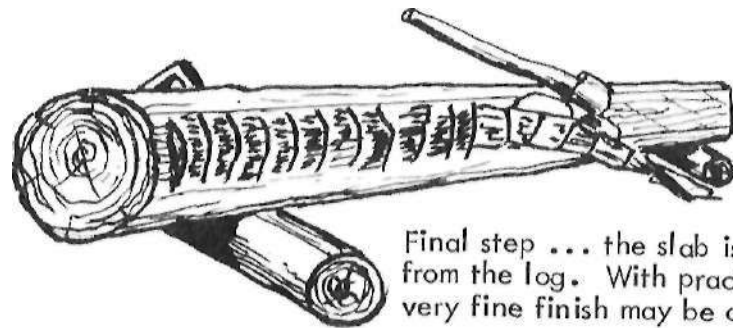
Chalk line stretched very tightly between nails (a) and (b), lifted straight up at (c), then allowed to snap down onto the log to print the cutting line.



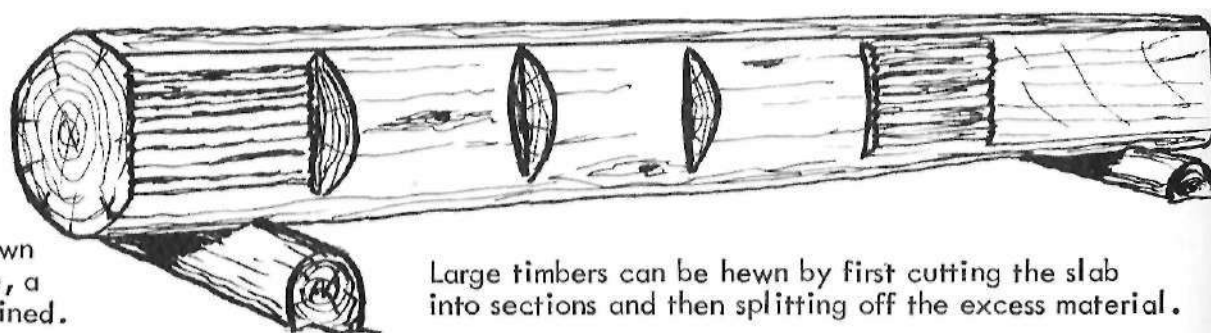
Scoring partly done. Work forward so that chips will break free. Scoring cuts should be 6 to 8" apart and very nearly to the depth of the cutting line.

While standing on the log, score cut it as shown above, right, by chopping vertical cuts about 6 to 8" apart along the side of the log to the depth of the chalk line for the full length of the log.

Now the broad axe is used. Stepping back along the log as work progresses, use strong strokes that are nearly straight down, and slice off the slab according to the chalked line. If the timber is very big, cuts may be made to the chalked line every 3 or 4 feet and the excess wood split off with wedges before finishing with the broad axe, as indicated below.



Final step ... the slab is hewn from the log. With practice, a very fine finish may be obtained.



Large timbers can be hewn by first cutting the slab into sections and then splitting off the excess material.

Hewing requires a good eye, skill, and strength, and an admiration for the oldtime axemen is quickly learned. 50 railroad ties a day was the winter's average cut by one of the best tie hackers working near Burns Lake when the C.N.R. line was being built. They say he appeared to work very slowly. But each time his broad axe dropped, it took a 3 or 4 foot slab off the log. Ties were 8 feet long and 10" on the face and, at 17\$ apiece, the tie hackers seemed to make a living. An indication of their skill and strength was that the log bunk house for this tie camp at Priestley was erected in one day by the 30 or 40 men waiting to get to work. Two fallers in the woods nearby skidded out the spruce logs with a team of horses to two men on the site who cut the horns off and sent the logs up to the 6 or 8 men on the building. Others packed moss, prepared the scoop roofing, or made bunks. "Next day they built the cookhouse," the camp boss told me. "They had to. The day after that, they wanted to start work." It saddens me that these men are so forgotten that sometimes, when I mention tie hackers, I see someone examining my necktie, lost in puzzlement.

WALLS

The real work of building may now go forward ... and here we will expect to use a round notch. I prefer this one for its simplicity and strength, its ability to shed water, and for the fact that the finished log still looks like a natural log. Suitable logs (generally the largest at the bottom) can now be rolled up onto the side walls of the building with the butt ends the opposite way to those of the first logs. These logs will rest on the end walls which are, of course, at right angles and higher. Place the log accurately over the position it is expected finally to occupy and mark the position on the end log where it is resting. The log will "belly down" because it is supported only at each end. Even the slightest sweep in a tree will make it swing downward. It is best to work on the log in that position for two reasons: it would require blocking or dogging to make it stay in any other position while chopping the notches and, much more important, when the notched log is turned over into its final position, the belly or bow will be up and this slight hump will be forced down and straightened by the log's own weight. If the bow is too pronounced for the log to be expected to straighten, a saw cut no deeper than absolutely necessary may be made from the top (at about the midpoint of the hump) to let the log down level.

It will be apparent, now, that the width of the notches will be the width of the log on which it is to rest. The depth of the notch will be equal to the distance between the log to be notched and the log below it when the notch is up (Step 1 on the opposite page of illustrations).

First, cut a rough notch in such a manner that, when the log is turned down, it rests about 1" above and parallel to the log on which it is to fit. Now bring out the scribes. Mark the log carefully its full length both inside and out including the notch and corners. If the scribes' cut is not sufficiently clear to see, trace it carefully with a fairly sharp pencil. A perfect, weatherproof fit is well within the ability of any axeman who, first of all, takes these measurements with utmost attention to detail.

When the log is turned back up, the edge of the notch is cut first. Work only to a width of about 3/4" (see Step 4) on both sides of the notch. Next cut the centre wood out to a depth which will give the finished notch a concave shape, ensuring that the log will bear its weight upon the edges. Now cut the V-shaped groove the length of the log adhering always to the scribed lines. If this work is well done, the log will fit the log below it very tightly. This full length groove can be cut with either a power saw or an axe, but to obtain the exceptional fit that is possible, it must be done accurately and leaving just the scribes' line showing.

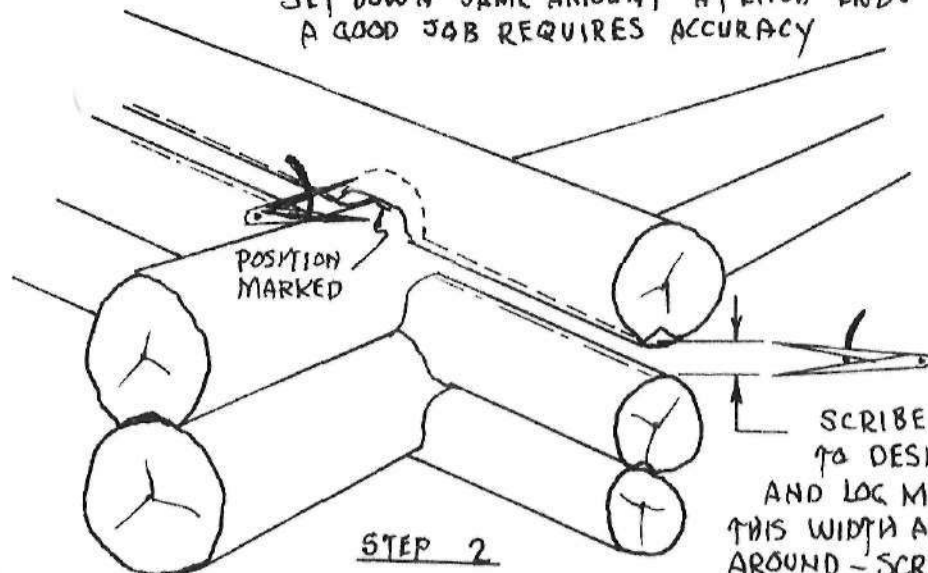
MORE ABOUT USING SCRIBERS

The purpose of a pair of log scribes is to transfer a predetermined measurement directly from one surface to an adjacent surface with a high degree of faithfulness. In log work, we will be transferring the pattern of the log below to the surface of the log above. Scribes are also used for finishing work along floors, partitions, windows and doors.

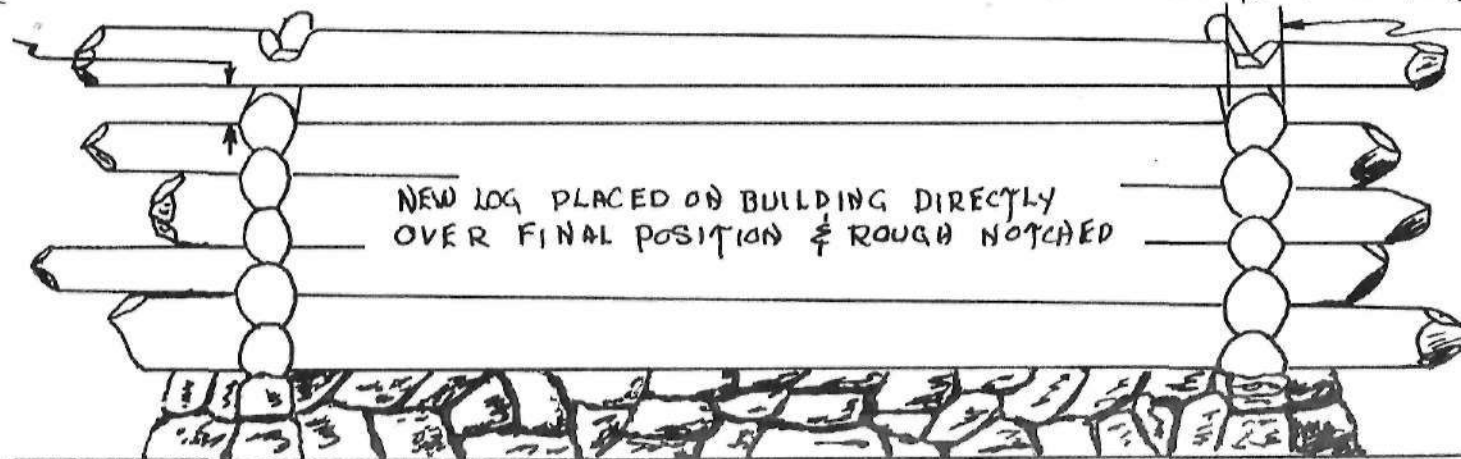
The scribe points are set to the widest space showing between two logs. The cutting points are kept vertical, that is, directly above one another and the handle is held in as perfect a horizontal position as you can manage. The scribed line is carried up over the notch in the case of a round notch (a, Fig. 5) and on to the end of the log (b, Fig. 5) that extends past the wall. Scribe both the inside and the outside of the log. Use the divider ends for marking around the



SCRIBER MARK DUPLICATES SHAPE OF LOG BELOW. LOG, WHEN CUT OUT, WILL SET DOWN SAME AMOUNT AT EACH END. A GOOD JOB REQUIRES ACCURACY



DEPTH OF NOTCH EQUAL TO DISTANCE BETWEEN LOGS



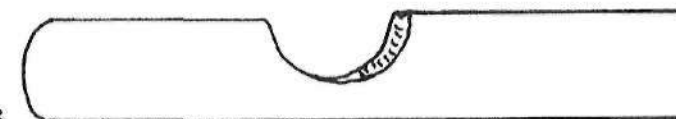
STEP -1 CUTTING ROUND NOTCH



STEP 3 ROUGH NOTCH CUT SOMEWHAT SQUARE, TURNED DOWN, SCRIBED, AND TURNED BACK UP TO FINISH



STEP 4 EDGE OF NOTCH CUT TO SCRIBED LINE ALL THE WAY AROUND



STEP 5 CENTER CUT OUT FULLY AND SLIGHTLY CONCAVE. GROOVE CUT TO LINE FULL LENGTH OF LOG. ("DRAWN")

NOTCH WIDTH EQUAL TO EXPOSED PORTION OF LOG BELOW

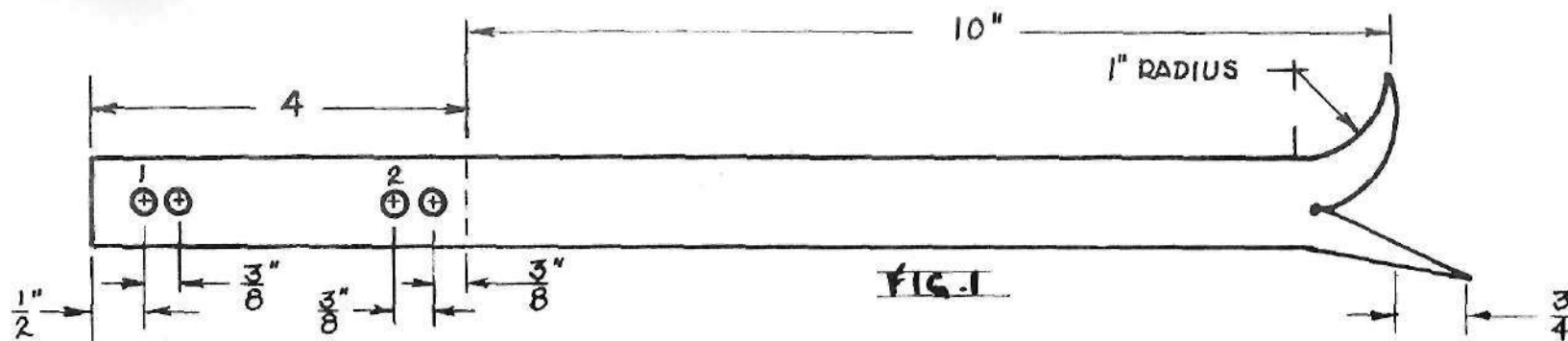


FIG. 1

ALL HOLES
DRILL $\frac{1}{4}$ "

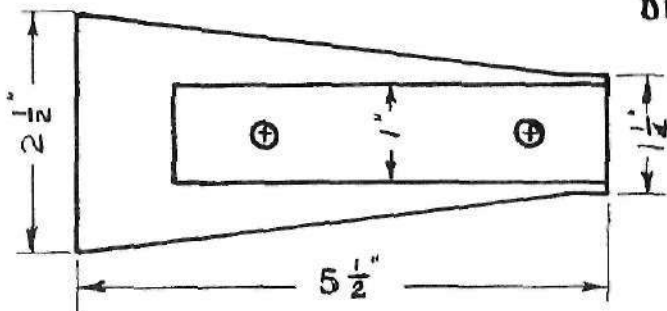
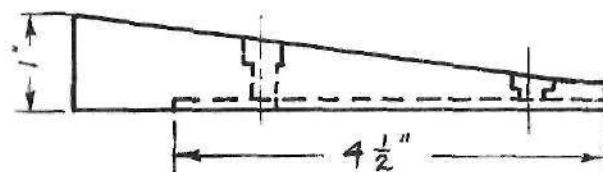


FIG. 2



MAKE TWO BLADES, AS IN FIG. 1, FROM $\frac{1}{8} \times 1$ " GOOD QUALITY MATERIAL. USED POWER SAW BAR IS GOOD. SAW IN $1\frac{1}{2}$ INCHES FROM TOP END, HEAT & SPREAD POINTS. DRILL HOLES AT HANDLE END BEFORE CURVING BLADES AS IN FIG. 3. RIVET BLADES TOGETHER AT HOLES 1 AND 2, MAKE HANDLE PARTS FROM HARD WOOD AND RIVET TO BLADES. BLADE POINTS MAY BE FILED DOWN SOMEWHAT NARROWER TO MAKE SCRIBING EASIER.

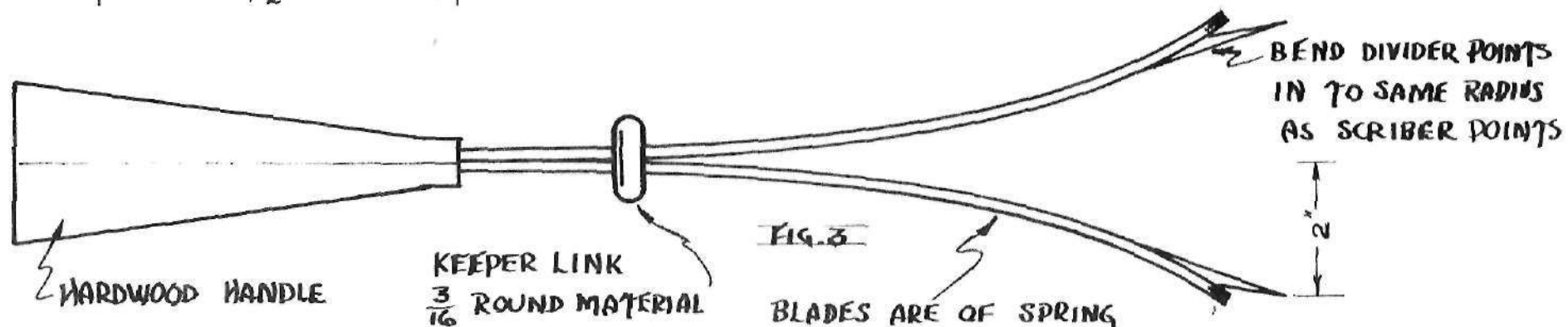


FIG. 3

BLADES ARE OF SPRING STEEL. POINT ADJUSTMENT MADE BY SLIDING KEEPER TOWARD POINTS

LOG SCRIBERS

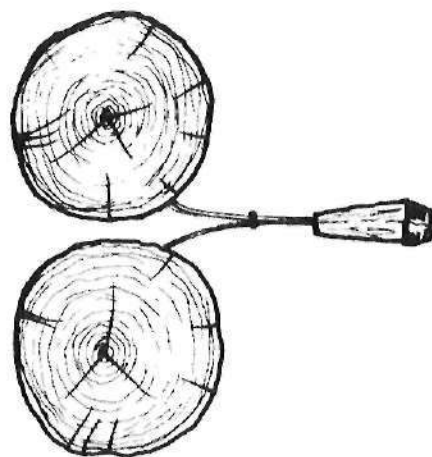


FIG. 4.

notch because the hooked points will not function here. The whole idea of scribing is that the two lines so formed are a constant vertical distance apart at any two points one above the other (x, y , Fig. 7). Therefore, by cutting away the intervening wood on the upper log, it must drop to an exact fit on the log below.

Careful work can create a fit that requires little, if any, chinking. The

scribing of a log might take the beginner as much as an hour's time to complete, but it is time well spent. When the marking is done, the log should be rolled inward on the building, with the notches up, for this finishing work to be done. Keep in mind that the scribed line will still be visible when the waste wood has been removed from around the groove and notches.

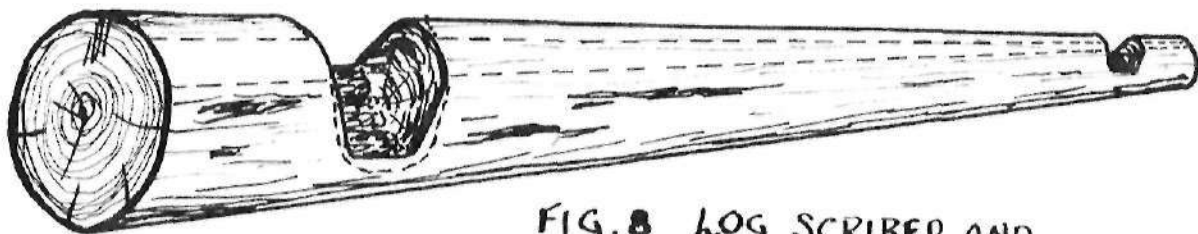


FIG. 8 LOG SCRIBED AND ROLLED UP FOR FINISHING

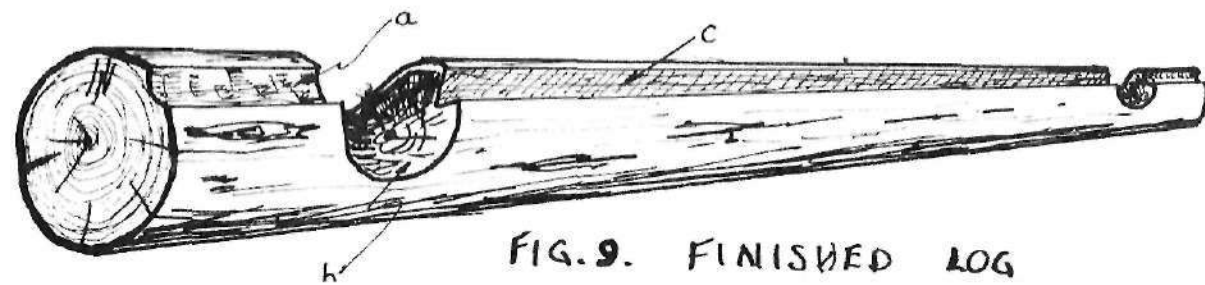


FIG. 9. FINISHED LOG

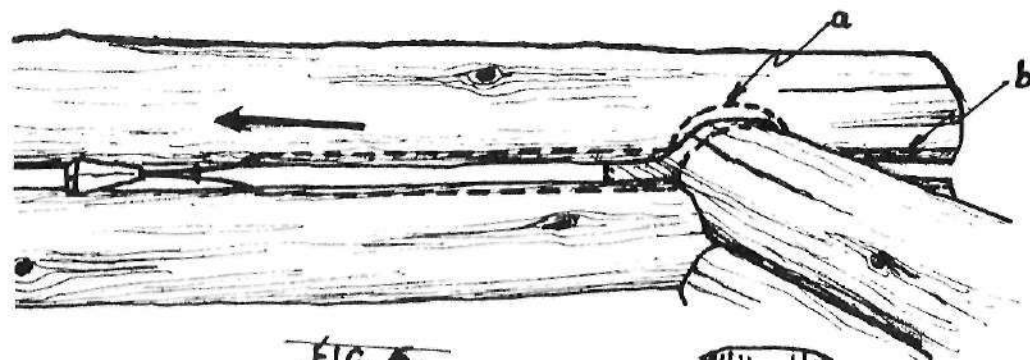


FIG. 5.

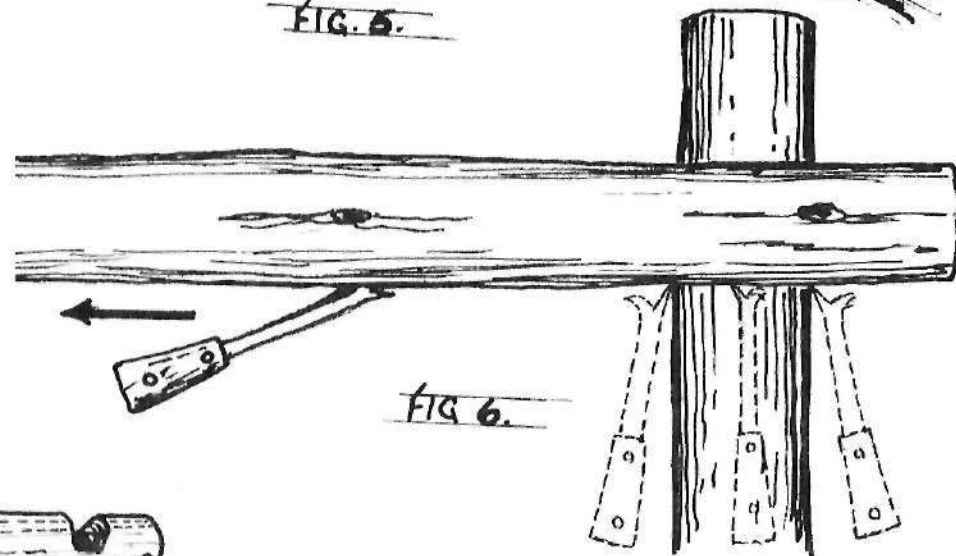


FIG. 6.

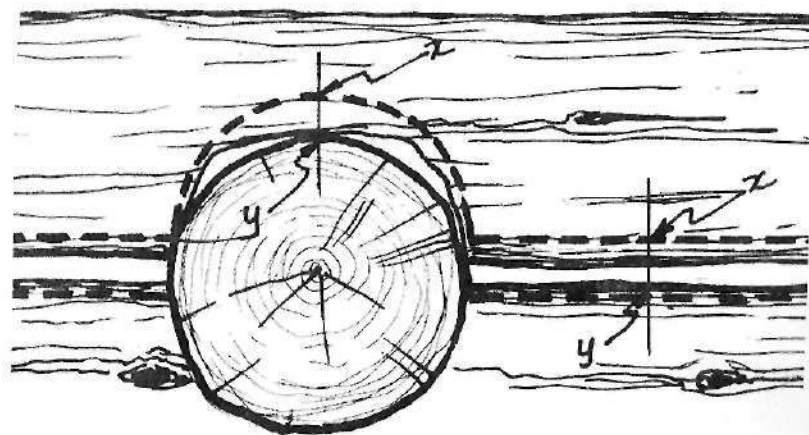


FIG. 7.

LINING UP THE WALLS

A good looking building must have walls that are straight and plumb. But logs are not uniform in size or shape, nor are they always entirely straight. A workable method is necessary, therefore, to achieve properly aligned walls. Apart from appearance, it is important that the weight should bear as nearly straight down as possible, so as to prevent any log from springing or settling out of place.

Decide first whether you wish to line up the inside or the outside of the walls, or whether to line up the centres of the logs. I think that lining up the centres assures that the weight is better balanced and gives a natural appearance on both sides of the walls.

One method of aligning a wall on the centres is to use a plumb or carpenter's level on every second log at the butt end, placing the centre of the top log directly over the centre of the butt directly below it. This gives reasonable results if the material is uniform in size.

A better method is to erect a straight pole or a 2x4 as a sight (see photo below and Fig. 1 on opposite page). This sighting pole may be placed at one end of each wall, a convenient distance from the building ... perhaps 20 feet away to be out of the main activity. If the log to be aligned is rough notched and in place near its final position, it will be possible to sight the centre line of the log from a position beyond the end of the wall and slightly above it. It should be possible to judge this log in relation to the real centre line and in respect to the general development of the wall. For instance, if a log has a slight sweep to the outside, much can be done to even out the general appearance by moving its two ends slightly inward, sometimes only 1/2" will do the job.

A bulged wall is probably one of the most common errors in misalignment. This is a wall that creeps outward as the building goes up, then creeps back in when the correction is attempted. Structurally this is bad even if the top log ends up directly over the first log. It is better to be ruthless and make the required correction as soon as the deviation is noted. It will look better in the long run and will be more stable.

FINISHING THE LOG ENDS

If the log ends are permitted to run well beyond the corners, you will have a greater choice of style in finishing them. Many people cut them straight off, 8 or 10 inches from the wall. This is neat and the ends are more easily painted if this is desired. I prefer a more rustic appearance obtained by tapering the logs to a chisel point. These may be alternately vertical and horizontal (as in photo at left) and may also be staggered in length. Or log ends may be sharpened to a pencil point with the axe. They can be kept longer at the eaves or at the foundation, or both, to give a buttress effect.



Great variety is possible here and much can be done to obtain an atmosphere of individuality and charm. The style you choose will be one of the marks of distinction by which your work will seem a work of art, giving much satisfaction. These finishing touches, and others to be discussed later, are well worth your thoughtful sketching and inventiveness.

Log ends are generally finished as each log is placed so that the scooped portion of the log can be scribed to fit the contour of the log below.

LINING UP WALLS

POST MAY BE SET AT A SHORT DISTANCE FROM THE BUILDING TO SIGHT CENTER LINE OF LOG.

SIGHTING MAY BE DONE BY MEANS OF A PLUMB LINE OR ROD HELD BY AN ASSISTANT

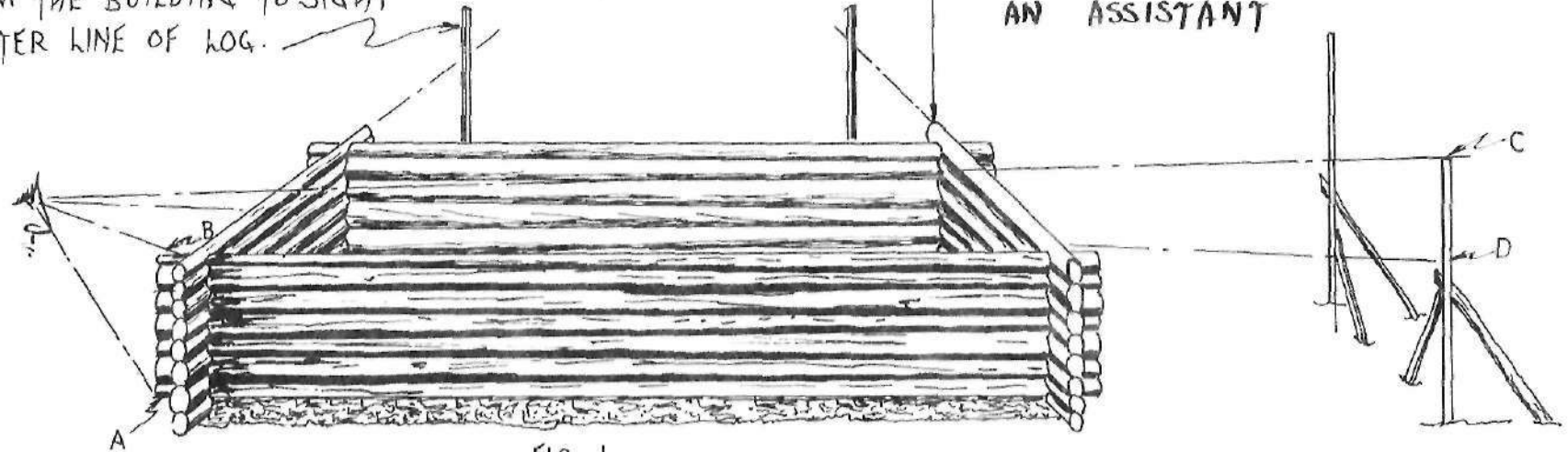


FIG 1

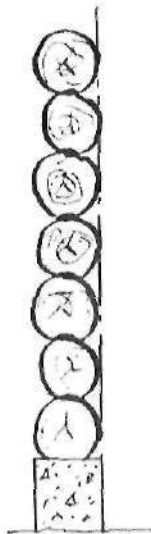


FIG. 2

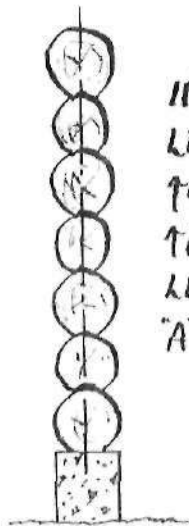


FIG. 3

IF THE LOG IS OFF LINE IT WILL APPEAR TO ONE SIDE OR THE OTHER OF A LINE SIGHTED FROM "A" TO "C"

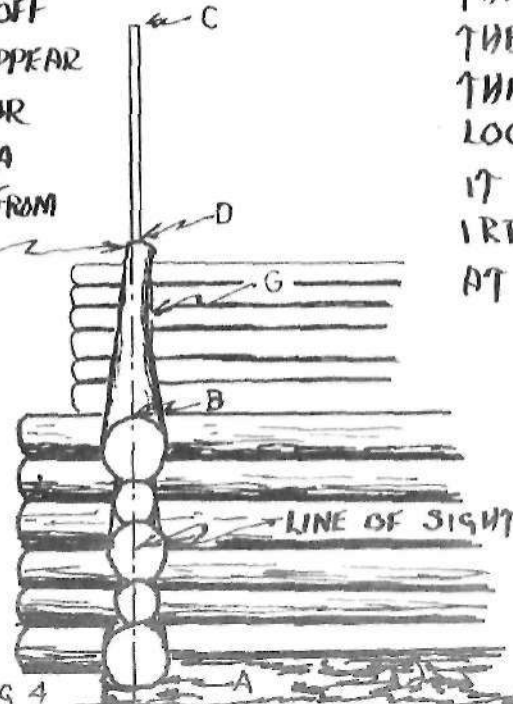


FIG 4

A LINE OF SIGHT MAY BE CARRIED THROUGH FROM A POINT ABOVE AND AT THE END OF THE LOG TO BE LINED UP. THIS SHOULD BE DONE AFTER THE LOG IS ROUGH NOTCHED BUT BEFORE IT IS SCRIBED. THIS WAY, ANY IRREGULARITY IN THE LOG, SUCH AS AT POINT G (FIG. 4.) MAY BE BALANCED OUT IN A MANNER PLEASING TO THE EYE. TO SIMPLY LINE UP THE CENTERS OF THE LOG ENDS MAY RESULT IN AN UNSATISFACTORY WALL APPEARANCE

TWO POSSIBLE WAYS TO LINE UP LOGS - CENTERS LINED UP (FIG 3) IS BEST FOR MOST PURPOSES

CHINKING

Sometimes log buildings are put up with the intention of driving the chinking material into the seams between the logs with a caulking tool after the building has been completed. But chinking applied this way will probably **fall** out and have to be repaired each year. Or if the chinking material is held in place by split wood strips or slim poles nailed horizontally into the crack, it not only creates a great deal of extra work but detracts from the finished appearance of the logwork.

The best method is to chink while building. The way I do it is, when the first three rounds of logs are up, to drive two large wooden wedges between the first and second round of logs as shown in this photograph. One wall at a time is done. I pack this space loosely with moss, taking special care that the moss is very evenly spread — too much moss, or moss in lumps, prevents the upper log from coming back down into its pre-fitted seat. When the next full round of logs is on the building, I again drive the wedges to lift the upper two logs and moss the second seam. (Lifting only one round might be slightly easier but there is danger of slipping without this additional weight.) This method gives a completely solid, permanent placement to the chinking material, binding it ever more firmly into the walls as the building settles. Because of the log's upper groove, the moss will be almost entirely hidden from view once the finished walls are clipped and trimmed.

Many materials have been tried for this job: lime-cement mortar; newspaper soaked in water, alum and salt? a sawdust and flour mortar; strips of metal; cow dung; fiberglass; and so on. Continuing experimentation may result in the discovery of an ideal material. To be better than moss or oakum, however, it will have to be unaffected by temperature changes, sunlight, shrinkage of wood, mechanical abuse or appetites of mice, and to be capable of retaining its position for many years.

Oakum is a good material used for caulking the seams of ships. It is loosely twisted coarse hemp fiber lightly tarred. It is relatively expensive, coming in bales of 25 or 50 lbs. But if, for some reason, you have no alternative but to hammer in chinking, this is the material specially prepared for the job.

Moss is the material I find most suitable, perhaps because it is part of the same forest environment from which my trees and rocks have also been gathered. One cannot deny its inexpensive nature or its availability; and it is pleasant to handle, light, very durable and, if wisps of it show here and there in a wall, it is pleasing to the eye.

Use only sphagnum moss. Its feathery lig&t quality makes it highly absorbent yet quick-drying. Indian mothers of yore used it for diapering their babies. It was used by pioneers as a quick dressing for wounds. The variety I use (of the 375 known) grows in the shade of spruce or pine stands where the snow melts last in



In the above photograph, one of the large wooden wedges can be seen lifting two rounds of logs and the first round of mossing is under way. The space between the logs has been filled with moss right over the round notch.

In this view, the top of the foundation wall is level and the side wall log was cut in half. I used a power saw. The logs are not too cleanly peeled in order to avoid a "slick" appearance.

spring. Good moss forms a blanket about 4 to 6" deep with only a few wood lilies or lady slippers growing through. The top layer will be pale green but underneath it turns to brown. All of it can be used as it will most likely peel clean from the ground. If weather permits, an expedition should be planned for collecting the moss for not only is this a good place for a picnic with blueberries nearby at the right time of year but also a great deal of moss is required for even a small building. So the whole family can be pleasantly busy for most of a day stuffing moss into sacks. Moss can be gathered far in advance and stored in sacks almost indefinitely

Fresh moss is handled more easily than dried out moss which becomes brittle. Plastic bags tied at the top will retain the moisture but if, for any reason, the moss does become dry before it is used, watering it restores its former flexibility immediately. It dries again quickly once it is stuffed into the walls, but I find the wetness desirable as it causes the moss to form itself more perfectly to the contours of the logs.



Students in my log building classes have expressed more skepticism toward the use of moss than toward any other aspect of log building including my positive dislike of mechanically peeled logs and indoor toilets. One expert builder confided in me that his wife would never permit him to use moss in her home as she was a very clean woman. Up to that point, I had never been aware of any cause to question my wife's attitude toward sanitation and considering my uninterrupted good health for the past twenty years of marriage, I feel that the implication is not valid. To have been used as a bandage for wounds, moss has to be unusually clean. "But doesn't it attract mice and bugs" they persist. Perhaps so, but I have never seen them. I did, however, find a newborn family of mice in a batt of fibreglass which had been left at the building project by a student wishing tactfully to introduce me to this material. By placing some heavy logs around the fibreglass, I was able to protect these rodents from accident or injury and, in due course, had the satisfaction of observing eight mice emerge from the pink fibreglass in an excellent state of health. They were, I admit, extremely clean young mice. As yet, I have found no example of a moss mouse nursery by which to make a comparison.



I have become so curious about this widespread skepticism toward moss that I have made a point of examining old and roofless log buildings and, in spite of the obvious soakings and resulting rot, I have found no sign of insect association with the moss. This surprised even me, for I understood that insects, given moisture, could live in almost any forest substance. Another surprise was to note the state of preservation in the wood surrounding the moss chinking; it was firmer than the wood in the rest of the log. Therefore, my opinion of the value of moss has simply increased. I can only guess that skepticism is actually a lack of confidence due to the unfamiliarity of moss as a building material. This, and the fact that it is free. I can't say I actually understand this, any more than I understand why fiddlehead fern and mushrooms go to waste in the woods while people buy them all faded and frozen and at high cost from a store.

This is not to suggest, however, that fibreglass or mineral wool are not good materials. I use it as insulation in floor and roof, with a good vapour barrier on the inside of the building. But I do believe that all manufactured materials should be avoided when a free and equally good fibre is available, so I note here that I have also seen moss used as successful floor insulation, too.

OTHER NOTCHES

Many types of corners have been developed and tried, either out of tradition or to fill a particular need. Several of the more common types are illustrated on the opposite page. The saddle notch is favoured because it is strong and sheds water effectively. This notch can be used with round logs drawn down and grooved to give a tight fit for their full length. The saddle notch must be carefully fitted to avoid an amateurish appearance. A locked joint or "egg crate" joint is easily made and gives a good appearance. It is strong and stable, well suited to hewn timbers. The log ends may be left long in order to give a more casual appearance. A drawback to this style, however, is that it would be very difficult to groove the logs for the tight fit which is so important. The Hudson's Bay corner is sometimes used but is not illustrated here. It is formed by spiking logs to boxed upright planks at the corners. It is unstable and does not allow the logs to settle firmly together. But it is a rapid way to build. Because the logs cannot settle, this style is not suitable for anyone wishing to draw and groove the logs to a tight fit. Lapped corners are easily and quickly done and may even be done with a saw or power saw so that these are generally used where speed is important. While the drawn fit could be accomplished, the extra time required to recut the corner might just as well be spent making a dovetail corner which would be stronger and more securely locked. The dovetail corner seems to be a natural outgrowth of a lapped corner. By simply changing the angle of the cuts slightly so that they slope inward, a naturally locked joint is formed.

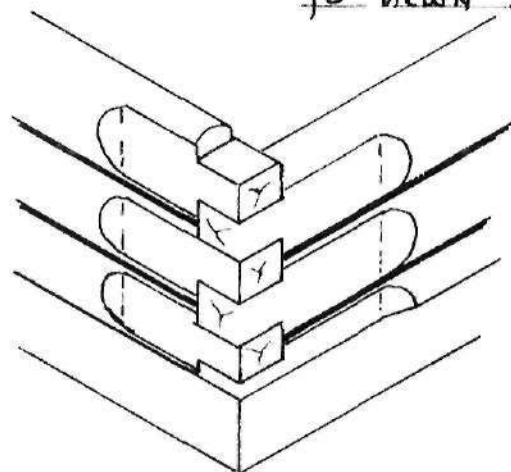
MORE ABOUT DOVETAIL CORNERS

These are considered by many to be the ultimate in log building construction and, from certain points of view, this opinion is well justified. In other words, there are pitfalls to consider before taking the final decision to use a dovetail corner.

First, it is necessary to have very high quality timber to make a good job of this corner, particularly if the log is to be hewn flat. If the timber is given to excessive taper, the hewn face will run out to round and a less pleasing appearance will result. Indeed, sometimes it has proven impossible to lower a log to meet the one below because the top end was too small. This leaves a gap in the wall which must be filled effectively if a warm building is to be hoped for.

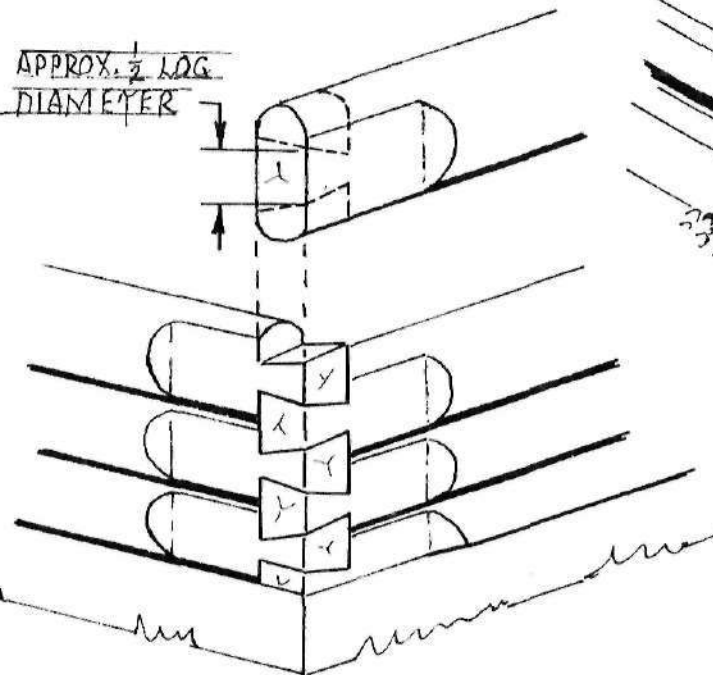
Second, the logs must be straight grained and not given to compression wood because if the tree has grown on an exposed site which produces these qualities, the log may twist in its carefully and laboriously fitted position, destroying much of the effectiveness of the joint, not to mention the appearance of the work.

THESE ARE COMMON TYPES OF
 CORNERS USED BY PREFERENCE
 OR FOR PARTICULAR REASONS. SOME
 ARE FLUSH CORNERS AND ALL ARE SUITED
 TO HEAVY LOG WALLS. OTHER CORNERS
 ARE POSSIBLE

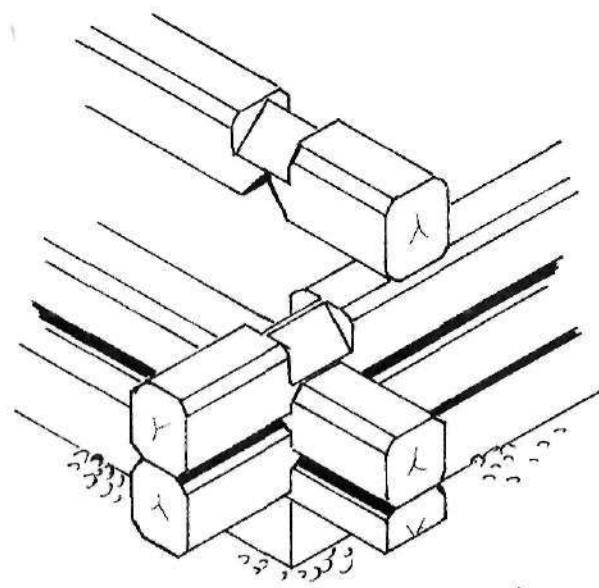


LAP JOINT

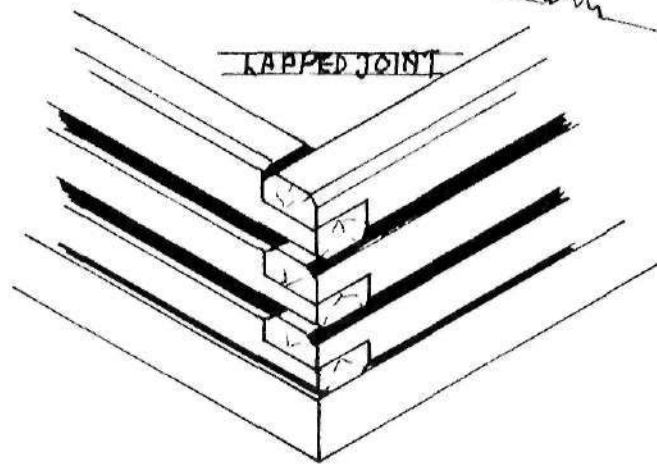
APPROX. $\frac{1}{2}$ LOG
 DIAMETER



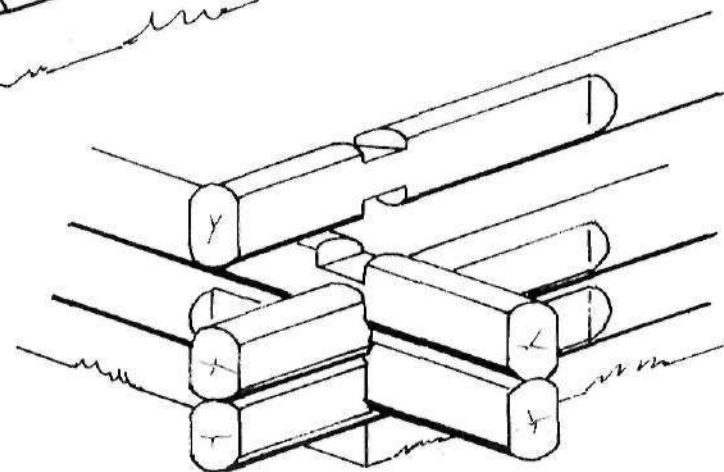
DOVETAIL



SADDLE NOTCH



LAPPED JOINT



LOCK JOINT

SOME OTHER CORNERS

DOVE TAIL CORNER

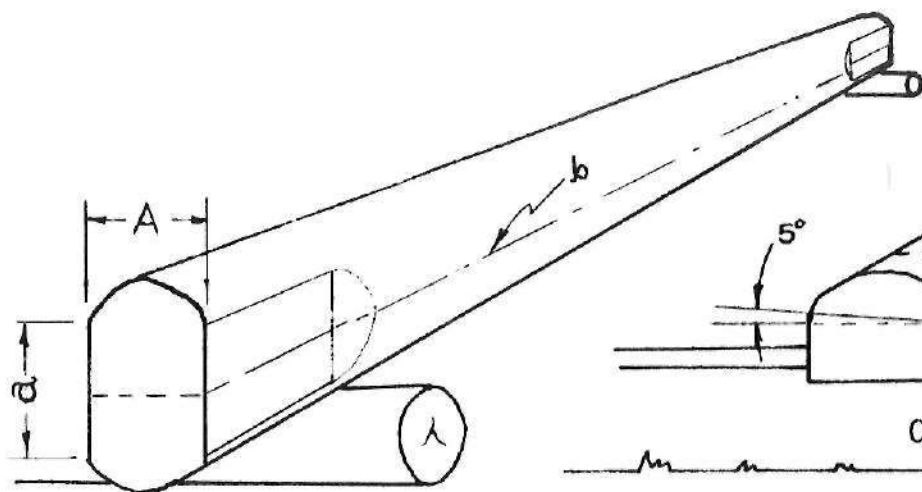


FIG. 1

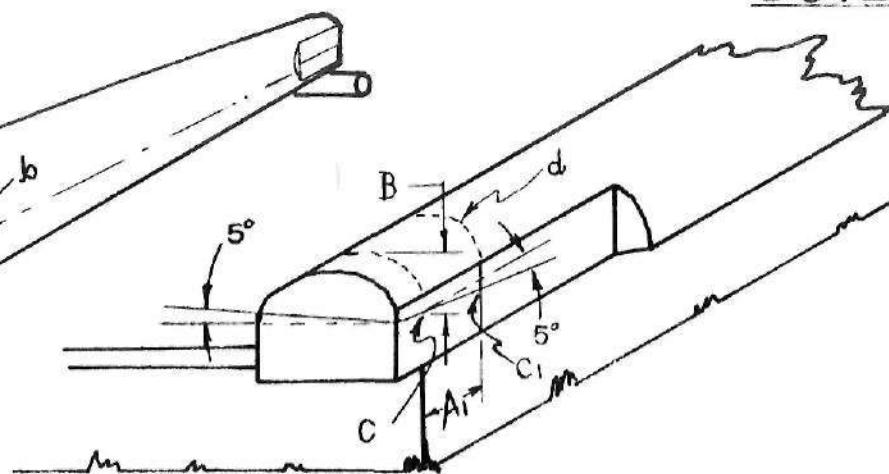


FIG. 2

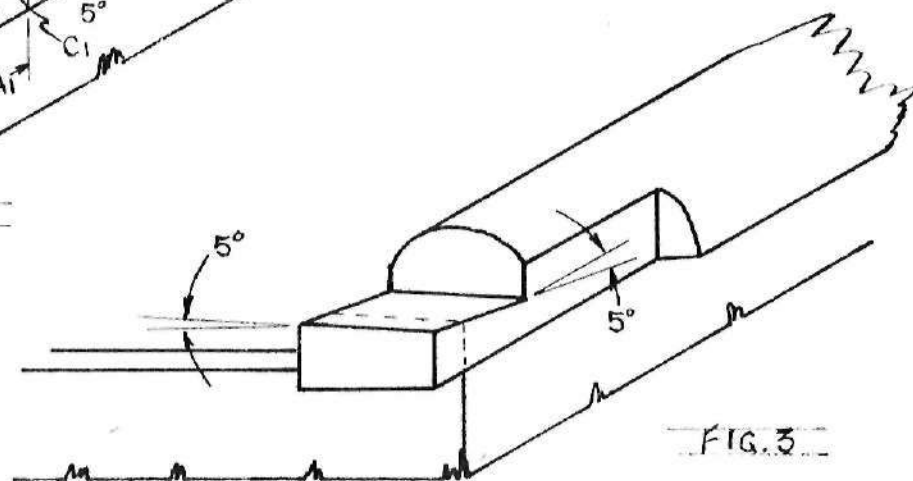
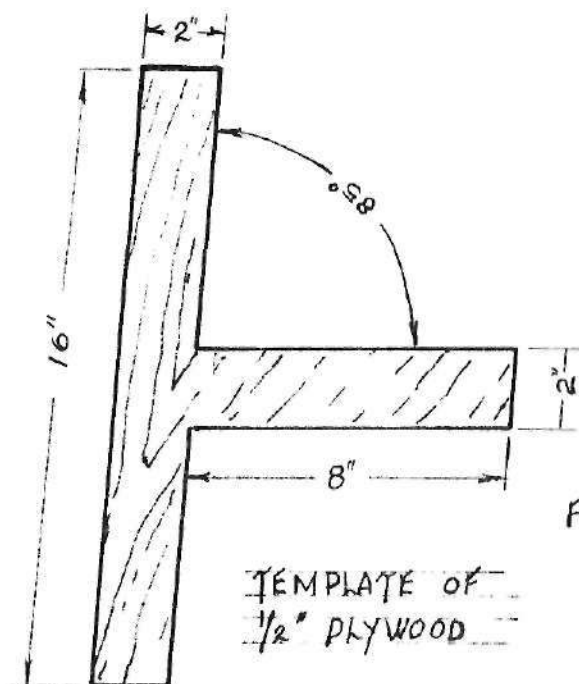


FIG. 3



TEMPLATE OF
1/2" PLYWOOD

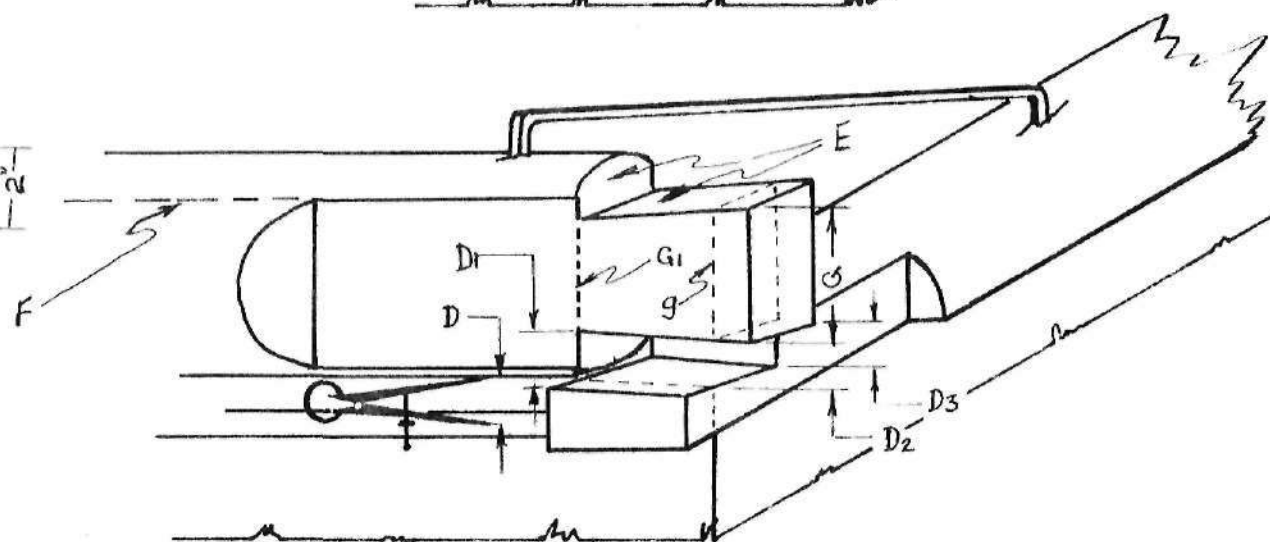


FIG. 4

Third, much judgment is required to produce a satisfying job and this may be one of the main reasons why an expert axeman may choose this style. Certainly, it is a challenge to the skill and judgment of even a practised builder.

But there is a great deal to recommend the dovetail corner. It is strong, stable, and will stand square and true longer than most. It sheds water well and, assuming that the timber is large, creates a tight and weatherproof fit. So for those who prefer this style of construction, the following is intended as a guide. If this style is to be attempted for the first time, I would recommend the construction of a small building first, by way of practice and experience. Or, at the very least, a few experimental corners.

To begin, select a wall thickness which can be accomplished by all the logs (Fig. 1, A) that are to be included in the walls. This measurement will be about 2/3 to 3/4 of the diameter of the smallest log at the small end, in order to produce a suitable face width "a", Fig. 1. Suitable measurements usually range from 6" to 8" but thicker walls may well be considered. For a 6" wall, the smallest top diameter should be about 9". Smaller logs have certainly been used but the skill required to place them becomes increasingly demanding.

The log to be shaped should be blocked up at each end so that it will belly down, and the ends hewn for a distance of about 12" to 18" to the wall thickness selected (A, Fig. 1). Care must be taken that the ends are made straight and true. Now the log is turned so that the flatted ends rest on the blocks in a horizontal position. By means of a chalk line, a centre line may be marked on the log ("b", Fig. 1) and the log split in half with a power saw, one half to be used on each end of the building. If the walls are to rest on corner blocks only, then of course this is not necessary; use the full log. If the log is not sufficiently large or if a power saw is not used, then the log may be flattened down with a broad axe.

Place a log on the foundation wall at each end of the building. Then place a mark equal to the wall thickness back toward the centre from each end mark (C1, Fig. 2). Next, locate a point on the outside face of the log, directly above the corner, which is 1/4 of the log diameter down from the top of the log (B, Fig. 2). From this point, slope a line downward at about 5° from level and toward the centre of the log to intersect the vertical line marking the width of the wall (C to C1, Fig. 2). With a sharp handsaw, make the vertical cut (d, Fig. 2). The bottom of this cut will slope up 5° from point C1 (lines may be extended to the end of the log to assist in obtaining an accurate cut and, in any case, some extra length should be left on the log). Lastly, flatten this surface. The finished surface should slant 5° from the horizontal both toward the centre of the log and toward the outside edge (Fig. 3).

When all four corners of the building have been treated in this manner and the first two logs are on the building with the butt ends the same way, the side logs are ready to be placed with both their butt ends pointed in the same direction (the second full round will have the butts at opposite ends, that is, the two butt ends meeting the two top ends on the one side, and two butts coming down on two tops on the other side). These logs may be cut slightly longer than the wall and flattened at the ends to wall width while still on the ground if there is some mechanical means of raising them onto the building. If the logs are to be rolled up onto the walls, however, it is perhaps better to do this work on the building.

When the ends have been flattened, turn the log belly up and in the exact position relative to the final position it is to occupy (Fig. 4) and secure it in place with a log dog. The hewn face must be truly vertical. By means of a pair of dividers, determine the distance the log is to be lowered (at each end) to meet the foundation (D, Fig. 4). Carefully transfer this measurement to the positions D1, D2, D3, and D4 (on the inside corner) and join these points with a pencil line on the hewn face of the log (for example, D1 to D2 and D3 to D4). When this has been done on each end of the log, the log may be turned over and the cut made. If the layout has been done with accuracy, the corner will show an excellent fit. Slight irregularities can be corrected by slipping the tip of a hand saw into the joint and working off any excess wood.

When the log is resting in place, the top cuts may be made (E, Fig. 4). Draw a plumb line ("g", Fig. 4) on the outside of the log and measure back the wall width (GI). Mark off about 1/2 the log diameter on this outside corner (G) then mark off the sloped line. To obtain uniformity in this, a template, as illustrated in Fig. 5, will be useful.

When all four corners have been prepared, the second round of logs can be started. If a closer fit through the length of the log is desired, 1/2 to 3/4" extra width should be set on the dividers at D (Fig. 3) and when the log is turned into place, a template of this thickness will be placed under each end — the same at each end. Now set the scribes to the width of the template and scribe the length of the log. The log may now be "scooped" to this line to obtain the tight fit that keeps a building warm. Some people advocate running a power saw back and forth between the logs to accomplish this fit but I find this a crude and inaccurate method, particularly when the saw is in inexperienced hands.

If the builder wishes to hew the logs flat for their full length, either inside or out or both, now is the time to do it. A chalk line may be snapped onto the top of the log between the flattened ends (F, Fig. 4). The single plane wall surface obtained this way is suited to a building constructed of large logs. Many solid and beautiful examples of hewn log buildings still exist in British Columbia, some of which are 150 years old. Shown here is the main trading post of the Hudson's Bay Company at Fort St. James, constructed in the French method of piece-en-pièce. The meat cache is done in the same style. I include here a glimpse of a roof at Batoche, Sask., the only other example I have seen of this way of finishing the eaves. Of historical interest is the fact that the original trading post and meat cache were built under the North West Co. fur traders from Montreal, of which Alexander Mackenzie and Simon Fraser were partners. In 1821 when the Hudson's Bay Co. absorbed the Nor'Westers, a clerk's house was added to the Fort St. James establishment and this building (dovetail corner pictured on page 37) was built by a Scot using quite a different style. All three of the remaining structures are in remarkably good repair considering the lack of concern shown by governments toward what was once the chief fur trading post in New Caledonia and the onetime residence of James Douglas who was later to become British Columbia's first Governor.

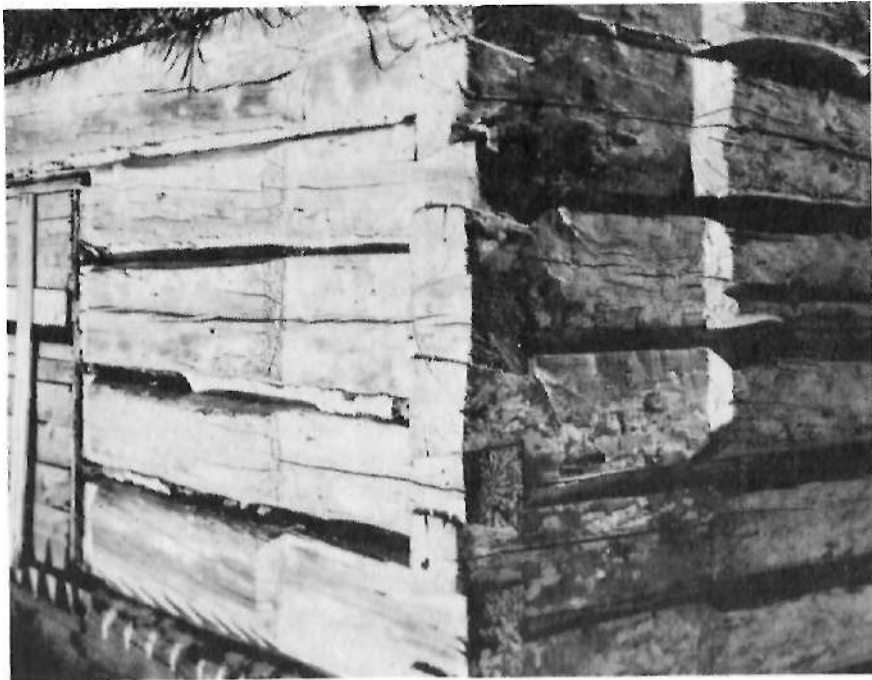


The original trading post at Fort St. James, on Stuart Lake, built in 1806 by the North West Co. of Montreal, later the main Hudson's Bay post in B. C. This photo taken in 1971.

The meat cache
at H.B.C post,
Fort St. James.



At Batoche, Saskatchewan,
overlooking the battlefield
of the 2nd Riel rebellion.



Piece-en-piece construction is an old and honourable method of building in Canada. It is closely related to timber framing and as such is a direct ancestor of modern platform framing.

The main advantage of this type of construction is that it makes it possible to construct very large buildings with relatively short logs.

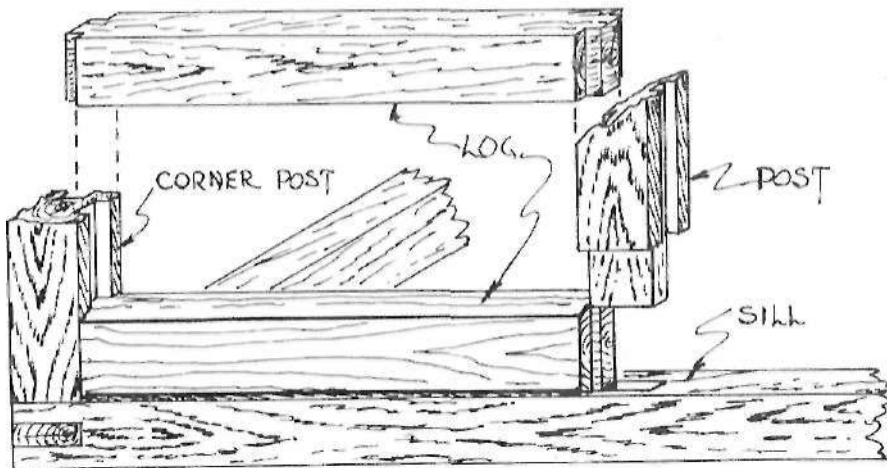
The timbers were usually hewn or sawn square, although round logs can be used equally well. The vertical members are slotted to hold the tongues at each end of the horizontal logs.

A good foundation is of the utmost importance, as is the settling space above the horizontal members, because of the uneven settling which is bound to occur.

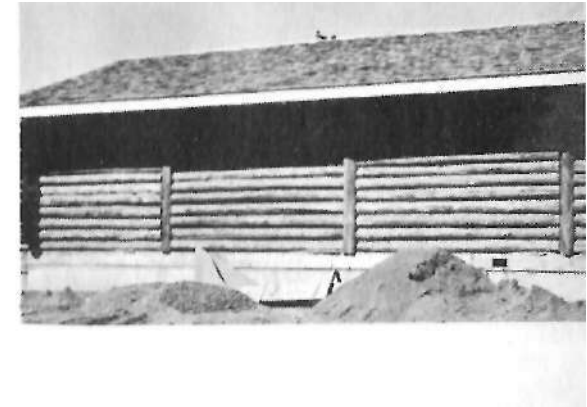
Left: Clerk's house at Fort St. James showing detail of dovetail corner,



Below: Piece-en-piece building at Jasper Park Lodge, Alberta.



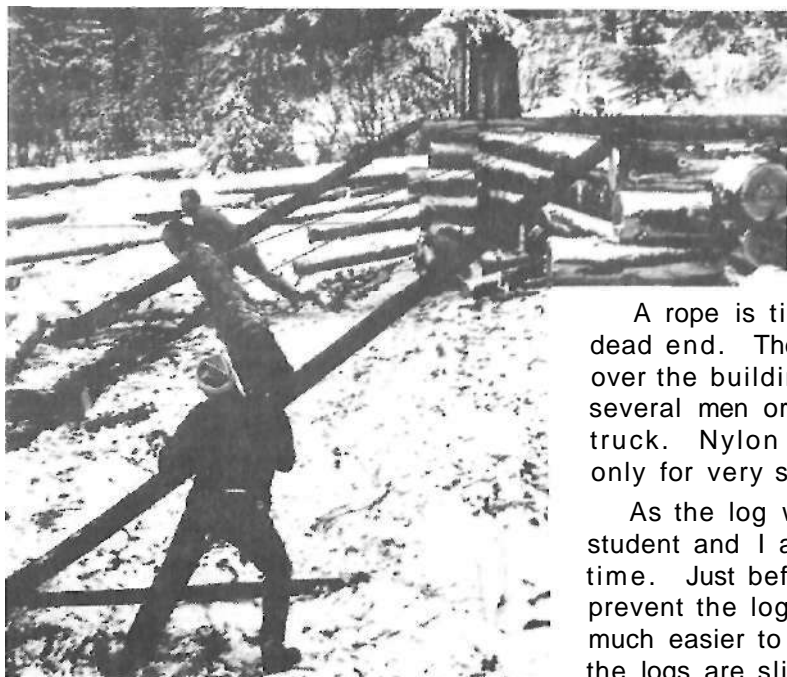
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Above: Modern piece-en-piece construction, 1971.

PUTTING THE LOGS UP ON THE BUILDING

When the building is two or three rounds high, it becomes more difficult to get the logs up onto the walls. A crane or a fork lift is a luxury not usually found in the lone woodsman's tool cache and besides these machines create more mess in one day than a family can readily repair in a year. I prefer the method of rolling logs up on skids with one or two ropes, where the site is open and level enough. Where the site is steep, or in a situation where the logs cannot be dumped close to the building, it is possible to use an aspect of high lead logging.



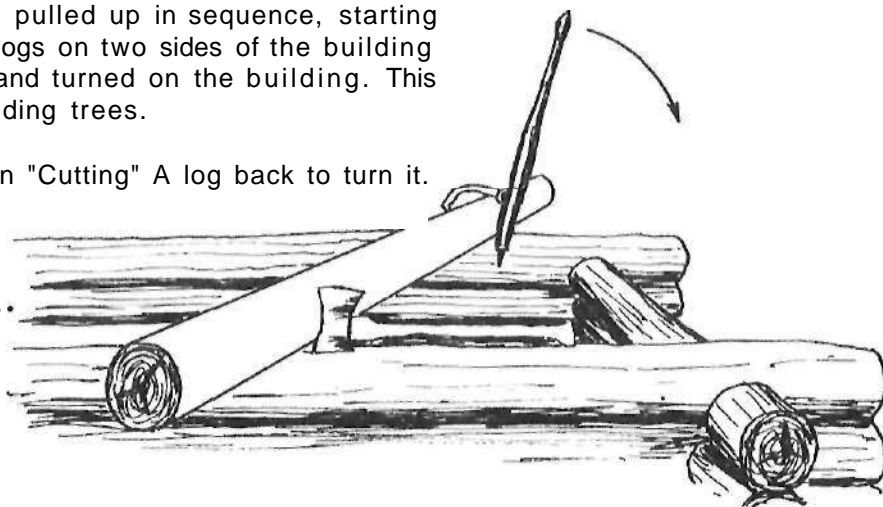
Skids, shown at left, are so simple a device as to need little description. On a low building, only short poles are needed to form the inclined plane on which to roll the logs.- They should form an angle of about 30° to the horizontal and, of course, need not be too heavy. When the walls get high, however, tough and dry spruce poles will be easier to move. Have two sets of skids to avoid having to move them from one wall to another. A small notch in the end of the log on which the skids rest will hold it against rolling off to the side. The skid should not protrude much above the wall and may be cut at an angle to assist in keeping it low

A rope is tied to the building at some opening, or a peevee hook may be used for the anchor for the dead end. The rope is then passed under the log to be rolled up (see illustrations for Placing Logs) and over the building to the power source. In the case of a small building, power may be supplied by several men or by a block and tackle. For larger buildings, you may need a horse, a tractor, or a truck. Nylon or polypropylene rope is very good, 3/8" cable is good, but Manila rope is adequate only for very small buildings.

As the log will roll faster at the butt end, this end should be placed lower on the skids (as a student and I are doing in the photo at left) so that both ends reach the top of the skids at the same time. Just before the log goes over the top end of the skids, a little additional speed will help prevent the log from slipping. It can readily be seen that a few extra feet of log length makes it much easier to keep control of the logs even if they do get a bit out of line. If it is raining, or if the logs are slippery, it will be necessary to have a rope at each end. The direction of the line pull can be changed by anchoring a pulley block near the centre of the building.

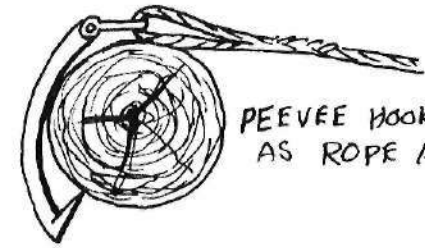
All parallel logs in a round can be pulled up in sequence, starting with the log for the far side of the building. This way it is possible to pull up logs on two sides of the building only, rather than from four sides. Logs may also be rolled up on only one side and turned on the building. This is sometimes desirable in order to make use of a difficult site or to preserve standing trees.

To turn a log on a building, roll it a few feet onto the walls and then "Cutting" A log back to turn it. drive an axe solidly into the log on which it is rolling (see illustration at right) on the side near the wall, so that when the other end of the log is rolled back it will butt up against the axehead. The log will now be across the corner of the building and may be brought around to right angles by judicious maneuvers. The log may be moved endwise by driving the peevee hook into it back of the wall on which the log is resting. Place the point of the peevee over the wall and "jack" the log ahead. This is very slow and is used only for small adjustments of a few inches. Or a log can be bounced over by rocking the log away from you and placing the corner of the axe under the log and prying ahead as the log rolls back.



PLACING LOGS

WALLS ARE UP AND TWO LOGS HAVE BEEN PLACED ON THE GABLE END. TOP LOGS & PURLINS ARE RUN OUT LONG IN FRONT TO FORM ROOF SUPPORT FOR PORCH. ONE WALL OPENING HAS BEEN ROUGHLY CUT TO MAKE ACCESS EASIER. ROPE IS USED TO DARBUCKLE LOG UP. TWO ROPES MIGHT BE USED. ROPE IS PLACED OFF CENTER TO THE BUTT OF THE LOG. NOTE THAT NOTCHES FOR PURLINS ARE NOW ON TOP OF THE LOG SO THAT END OF GABLE LOG WILL NOT BE CUT OFF WHEN ROOF SHAPE IS CUT. POSITION OF PURLINS IS JUDGED BY USING A STRAIGHT EDGE FROM THE WALL AT THE DESIRED PITCH.



PEEVIE HOOK USED AS ROPE ANCHOR

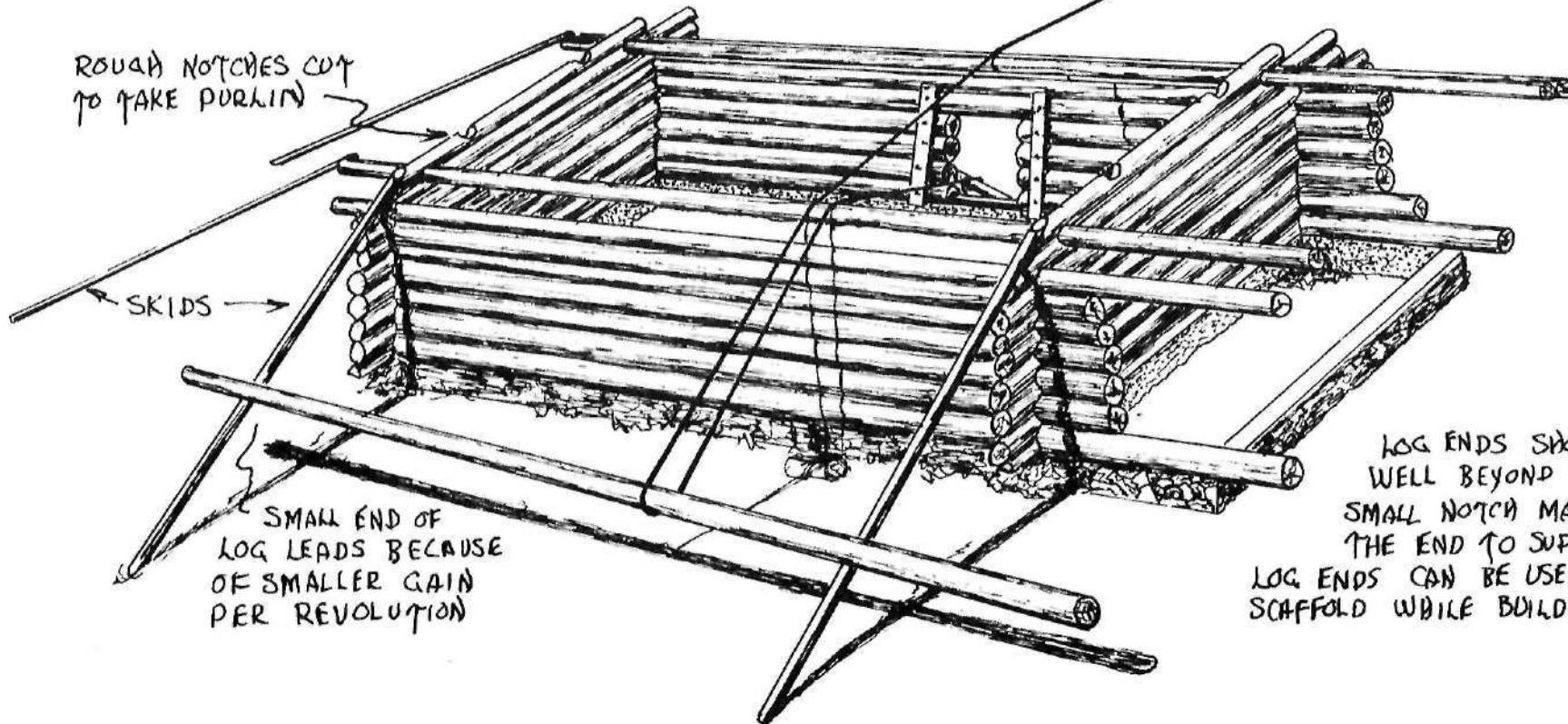
POWER SOURCE - BLOCK MAY BE USED TO ALTER DIRECTION OF PULL

ROUGH NOTCHES CUT TO TAKE PURLIN

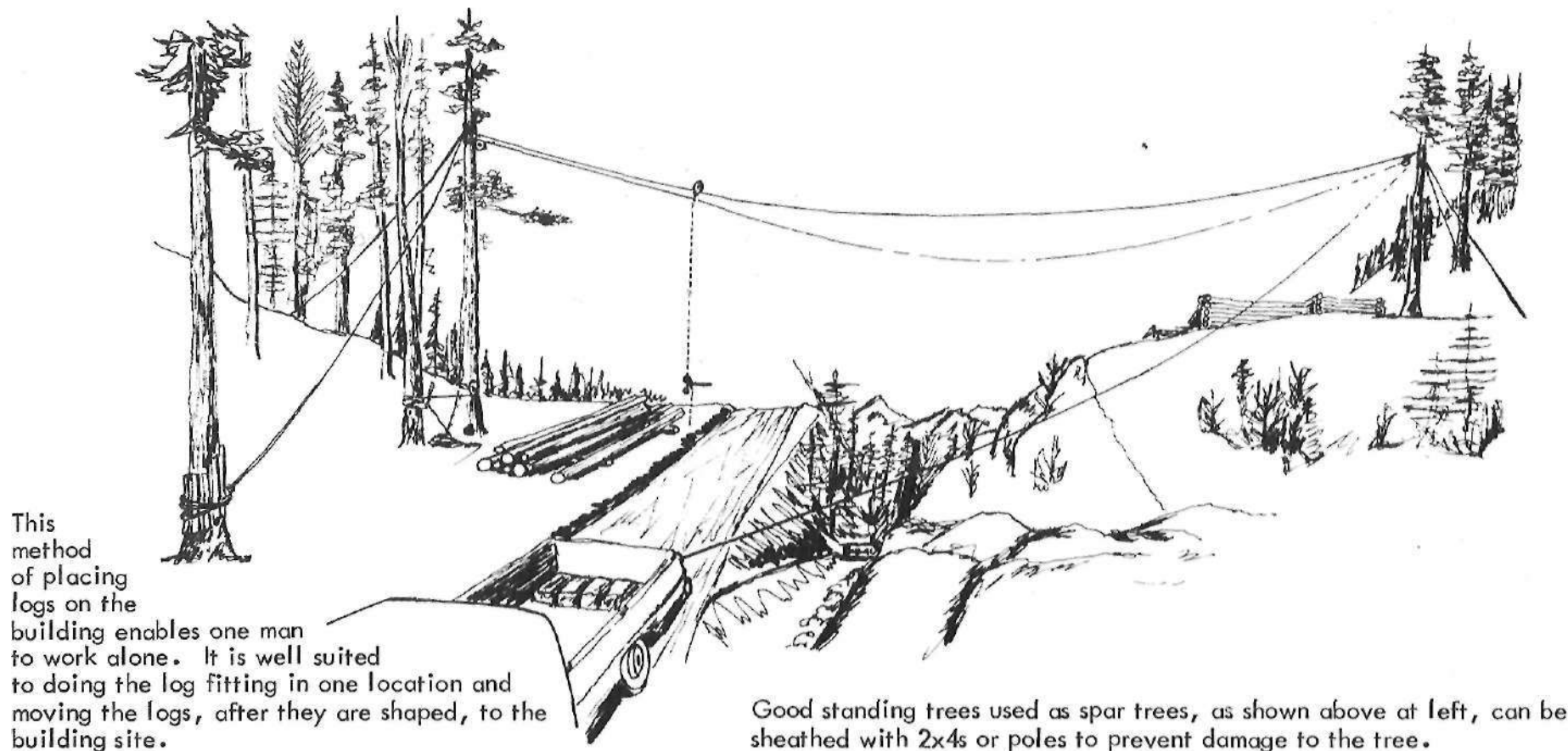
SKIDS

SMALL END OF LOG LEADS BECAUSE OF SMALLER GAIN PER REVOLUTION

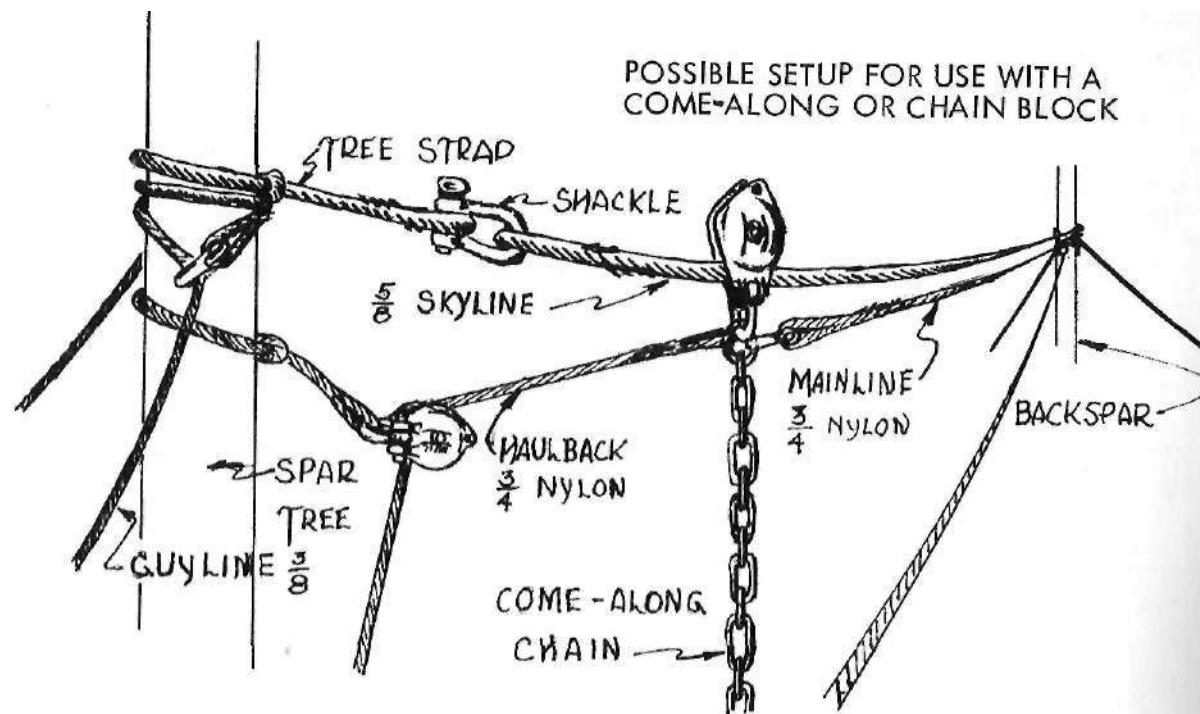
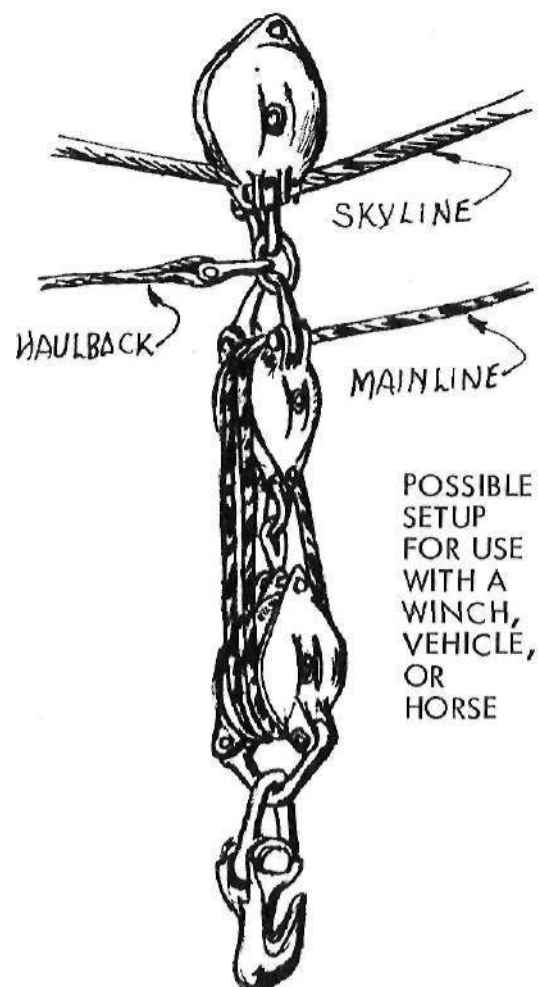
LOG ENDS SHOULD RUN WELL BEYOND CORNER - A SMALL NOTCH MAY BE CUT IN THE END TO SUPPORT THE SKID. LOG ENDS CAN BE USED TO SUPPORT SCAFFOLD WHILE BUILDING



High lead logging, as the builder will use it, borrows only those ideas and materials needed to lift logs from the ground onto his building. Actual high lead setups will not be described as their many systems of cables, blocks, and spar trees are used to accomplish much more complicated purposes than we need here. The term "high lead" explains the difference between having the "pull" exerted on the log from a source on the ground as opposed to having the pull exerted from a point above the log. In other words, lifting and swinging the log rather than dragging it. This difference explains why, when the site is a difficult one, it becomes desirable to be able to hoist the log clear of obstacles and set it on the building by remote control. The method suited here is the Skyline Carriage which, for practical purposes, should be limited to 100 to 200 feet. It consists of stretching a cable between two points so that the cable passes over the building site and the log pile or somewhere close to the log pile. The anchor points are most often good trees although A-frames, spar trees, or high ground would be suitable.



5/8" steel core cable is suitable for moving most building logs for a distance of 200 feet but any error on the side of additional strength is a good idea. Cable ends should have eye splices in them. Cable clamps are not too suitable but can be used if there is no one around who can splice cable. Cables should be fastened to trees with a short "tree strap", which is a short piece of cable at least as large in diameter as the one which will be fastened to it, and it will have an eye splice in each end. One end is placed around the tree and the other slipped through it so that the tree is "choked". Other gear such as mainline blocks or skyline is shackled to the protruding eye. If a line is to be passed around a tree and shackled back on itself be sure that the shackle pin is in the eye rather than on the line so that working the line will not tend to screw the pin out. Logging spars require 6 guylines but for our purposes 2 should be enough unless there is to be a great deal of side pull. 3/8 or 1/2" rope core line is suitable for the illustrated setup. The line used to lift the logs is 3/4" nylon or polypropylene rope.

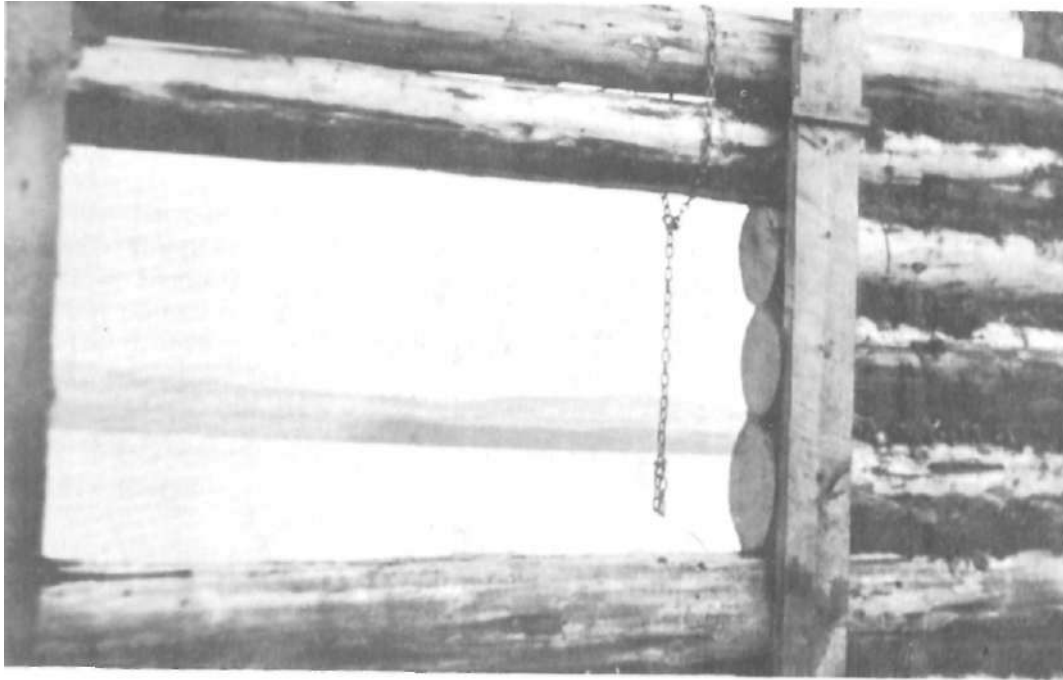


Guylines should be choked to the spar tree as close as possible to the tree strap supporting the skyline. At the lower end, they may be secured to stumps, trees, or anchors buried in the ground. The main thing is to ensure that they are solid. For this kind of set up, three guylines would be an adequate number.

FRAMING THE OPENINGS

When the second round of logs has been placed, door openings should be located and marked on the log. A 2" auger is used to bore holes about 4" beyond the door opening on each side so that a mortise groove may be cut later in the log. This hole should extend 2" into the sill log, and should be bored in each log of door and window openings until the second round above the opening. When the walls are partly up, planks may be spiked to the logs on each side of any proposed opening and this cut out a little narrower than final size in order to give you more ready access to the interior of the building.

When the walls are all the way up, spike a 2x6 plank on each side of the door or window and cut the opening, but cut it about 1" narrow on both sides to allow for the finish cut. Now draw parallel lines 2" apart down the center of the log ends and cut out the wood to the auger hole. Continue the mortise about 10" above the opening and 2" below. Next slide a length of 2x4 up into the mortise and then lodge it firmly in the seat below. The remaining 8" of space is to allow for settling.



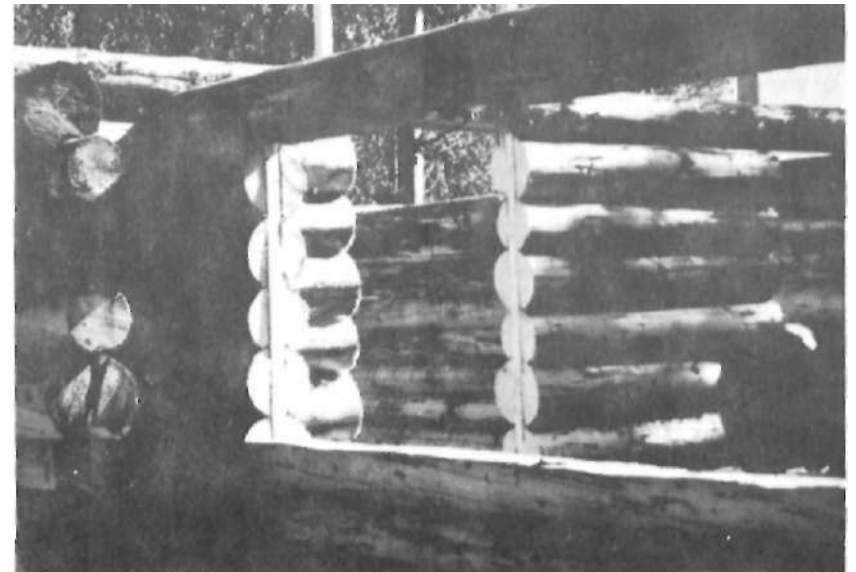
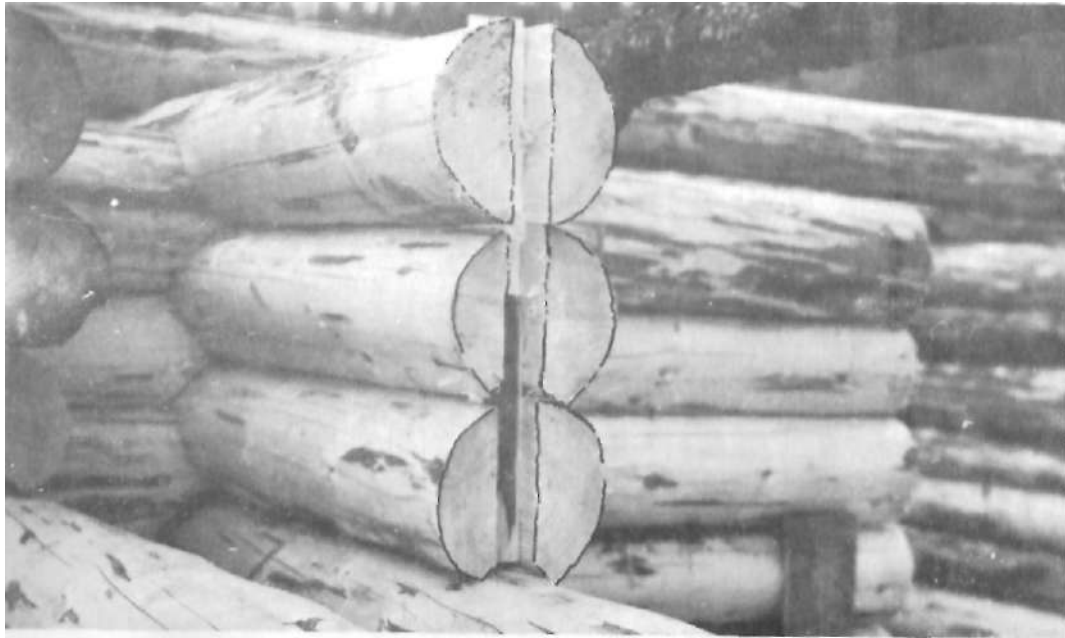
FRAMING THE OPENINGS

Top left: When the walls are partly up, planks may be spiked to the logs on each side of a door or window opening, and the opening cut out a little narrower than final size. This provides quick entry to the interior of the building while work is in progress. Otherwise, you will probably not cut these openings until the roof is on. Never cut into either the top or bottom logs. (Note the chain which, on this house, acted as an anchor for the rope used for pulling the logs up onto the building.)

Bottom left: Window opening, in this example, is being built up because only short logs were required on either side of a very large window. The mortise has been cut and a short length of 2x4 has been used to support the logs.

Bottom right: This is the same window opening shown at left, with a vertical post in position in the mortised slot. The finish cut is still to be made.

If this work is neatly done there is no real need for either door or window trim. To keep the cut straight and square, use a cross-cut saw or a hand saw. A power saw is sometimes too difficult to handle and tears too much for this.



FRAMING OF OPENINGS

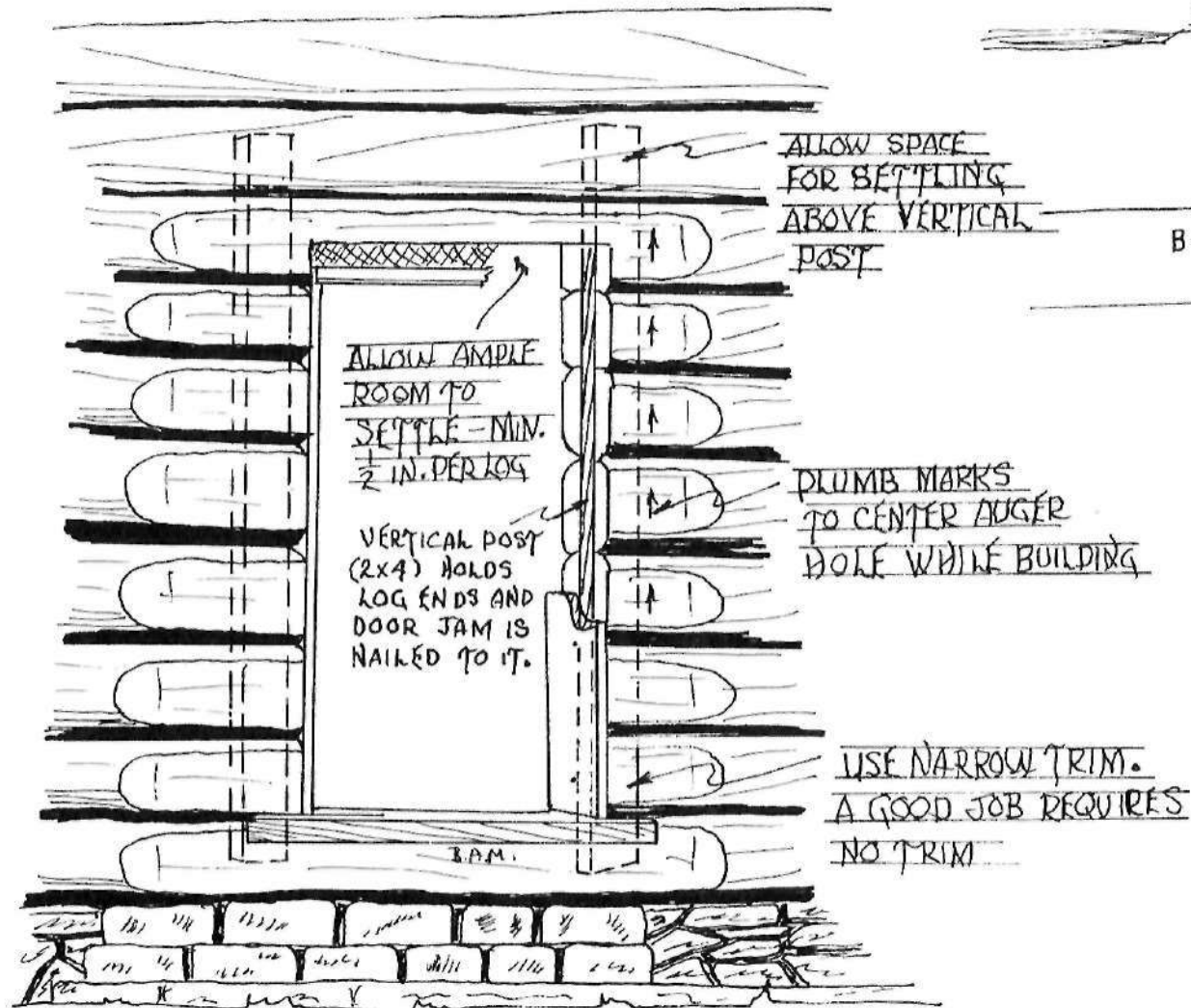


FIG. 1.

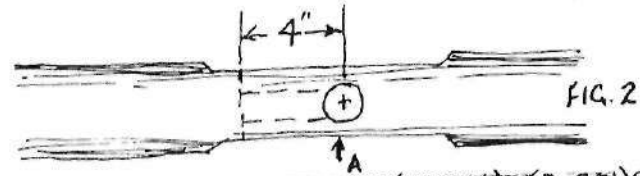


FIG. 2

TOP VIEW - UNDER CONSTRUCTION
OPENING NOT YET CUT - PLUMB MARK AT "A"

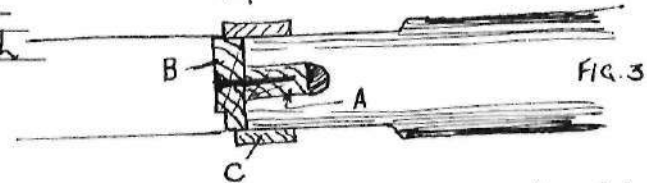


FIG. 3

TOP VIEW, FRAMING "A" - VERTICAL POST IN SLOT "B" - DOOR JAMB
C - TRIM IF DESIRED



FIG. 4.

LOG NOT FLATTENED IF NO "TRIM" USED

DOORS AND WINDOWS

Door and window frames can be made up on the job, and are often much more suited to a log building. Plank doors are solid and very serviceable. A three-batten door is made from four planks planed to 1-3/8" net thickness and 7-1/2" width. Three 1-1/2" battens are set 3/8" into the planks, glued and nailed to the inside. Such a door will not sag. However, shrinkage and warping could occur if the wood is not sufficiently seasoned. The use of cedar or fir is recommended.

Thermetically sealed double pane glass can be used as well as single glazed windows and may be placed solidly into a rabbeted window frame. The glass is bedded into caulking material and a 1/4" margin left to avoid binding. Single sheets of glass 4 feet square were used in the house at Francois Lake and, with ample Tieader space, have withstood many years of settling without damage. Sliding windows can be made by cutting a groove around the frame and placing two sheets of plate glass in the grooves in such a manner as to allow them to slide past each other. The top groove is cut deeply enough that the glass can be slid up into it, then dropped into the bottom slot without being released from the top. Ready-to-install factory-built windows which slide open, lock shut, and have sliding screens as well, have become extremely expensive. In this region such windows freeze shut (or open, as the case may be) in winter. So it seems better to install fixed windows — that is, glass bedded in hand made frames — and provide separate hinged openings for ventilation. This would be much less costly and much more efficient in use.

GABLE ENDS

When the top of the walls are completed, the gable ends may be made using logs or framed with lumber or timbers. Hip or mansard roofs can eliminate the gable end but they are not commonly used on small buildings.

The gable end made of logs is held in place by purlins which are simply logs reaching the length of the building but lined up with the anticipated ridge. These logs will be lower than the roof line by about 4" to allow room for the rafters. Gable end logs may be pinned in place by boring two 2" auger holes through the log and the log below, then driving a 2" square peg into the hole. Notches for the purlins are cut into the log below. This is different from the wall logs, but in this manner the ends of the gable logs will not be severed when the roof slope is cut. If the building is large enough to require several purlins, you will have to devise some means of getting them approximately in the right position to line up with the ridgepole. Following is a suggestion as to how this may be done, though you may find a way that suits you better.

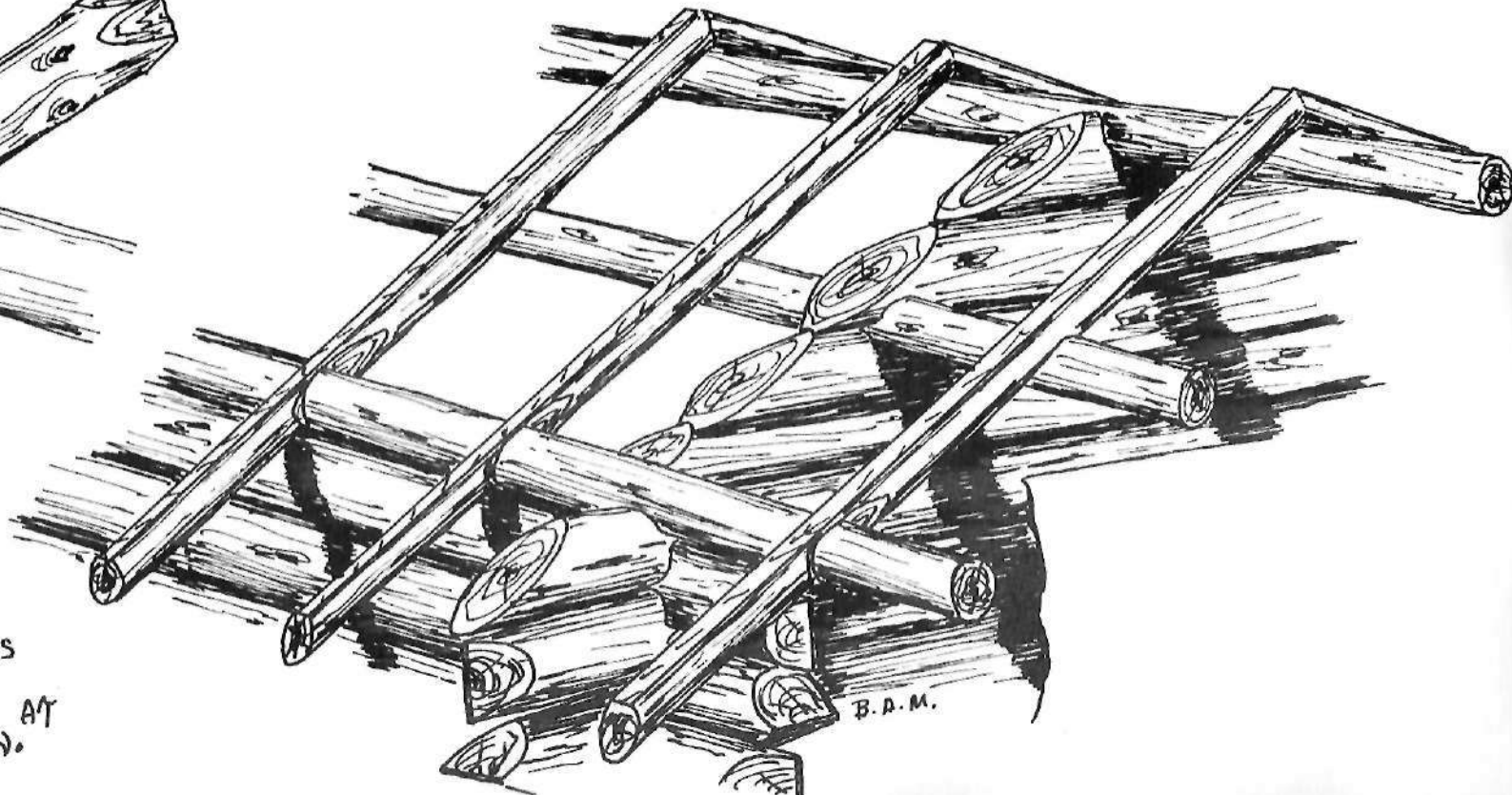
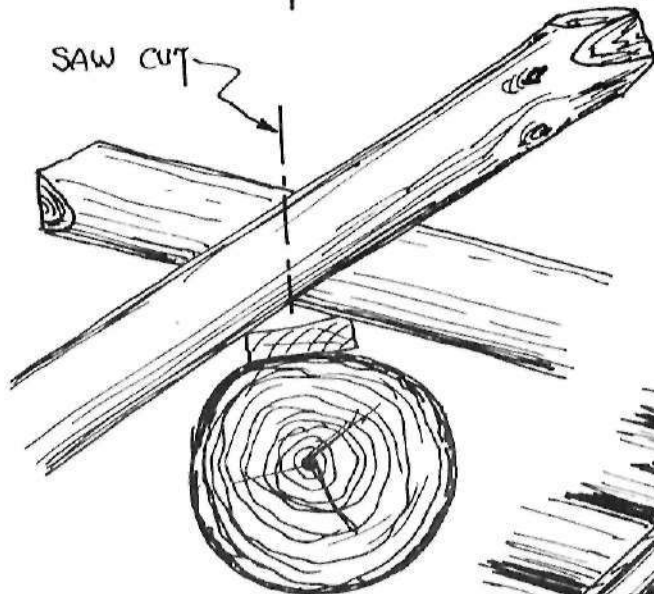
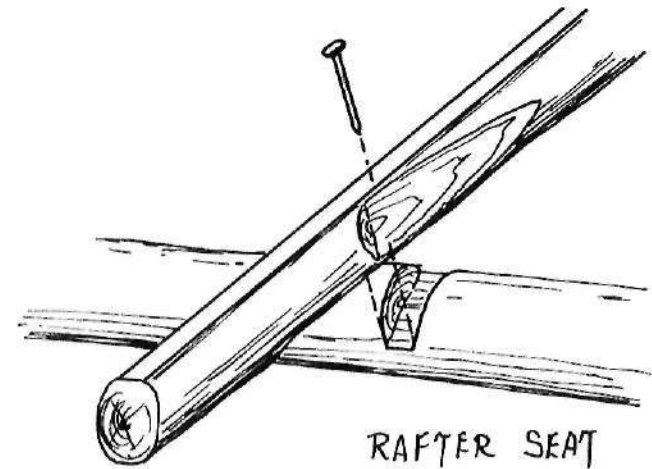
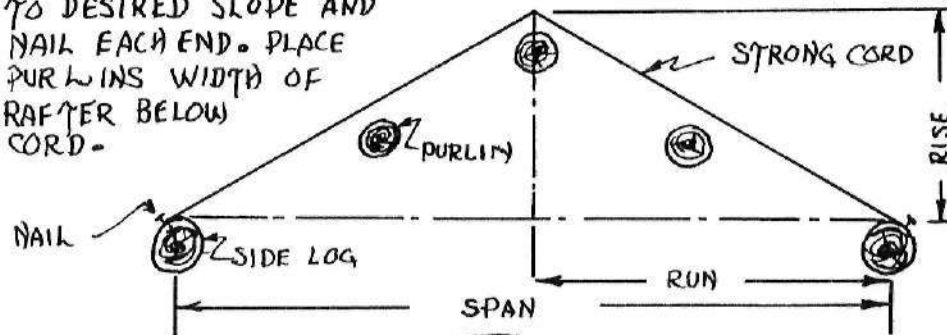
We will assume that you are going to use log gables and that you are going to run the purlins parallel to the long side of the building. The pitch of a roof is arrived at by dividing the total height of the roof above the plate (called "rise") by the total span of the roof and expressing this as a fraction. A building 24 ft. wide with the tip of the roof 8 ft. above the top log of the wall (which we will take to be the plate) will have a 1/3 pitch. A roof having less than 1/5 pitch is not considered suitable for shakes.

Drive a small nail partly into the outside of the top logs near each corner. Attach a length of cord or better still, wire, to these nails so that when the center is pulled up tightly it will reach where the peak of the roof is to be. This point can be located by measurement from the mid-point of the end wall in accordance with the pitch you have decided upon. This line represents the top of the rafters. Place a log on the gable end of the building in the usual way so that the end wall is now one log higher than the side wall, and rolt two purlins up onto these. With the butts to the front and extending as far to each end of the building as the roof is planned to cover. Our problem is to notch into the end wall log one-half the diameter of the purlin at such a position that the thickness of the rafter remains between the purlin and the wire which marks the roof. The problem is solved by placing the purlin on the end wall log where the distance from the wire to the center of the purlin is the average height of the rafters (e.g., 3 to 4"), that is, if the purlin is 8" in diameter it would be placed just touching the wire. If it is 6" in diameter, it would be placed 1" below the wire. Run the purlins straight down the building parallel to the wall. A little adjustment on the notches will take care of any height differences.

A very long building may require support for the purlins in the center. This can be done with an extra log across the building placed one log below the top side wall log and perpendicular supports put under the purlins — W braces can be devised if the span warrants them.

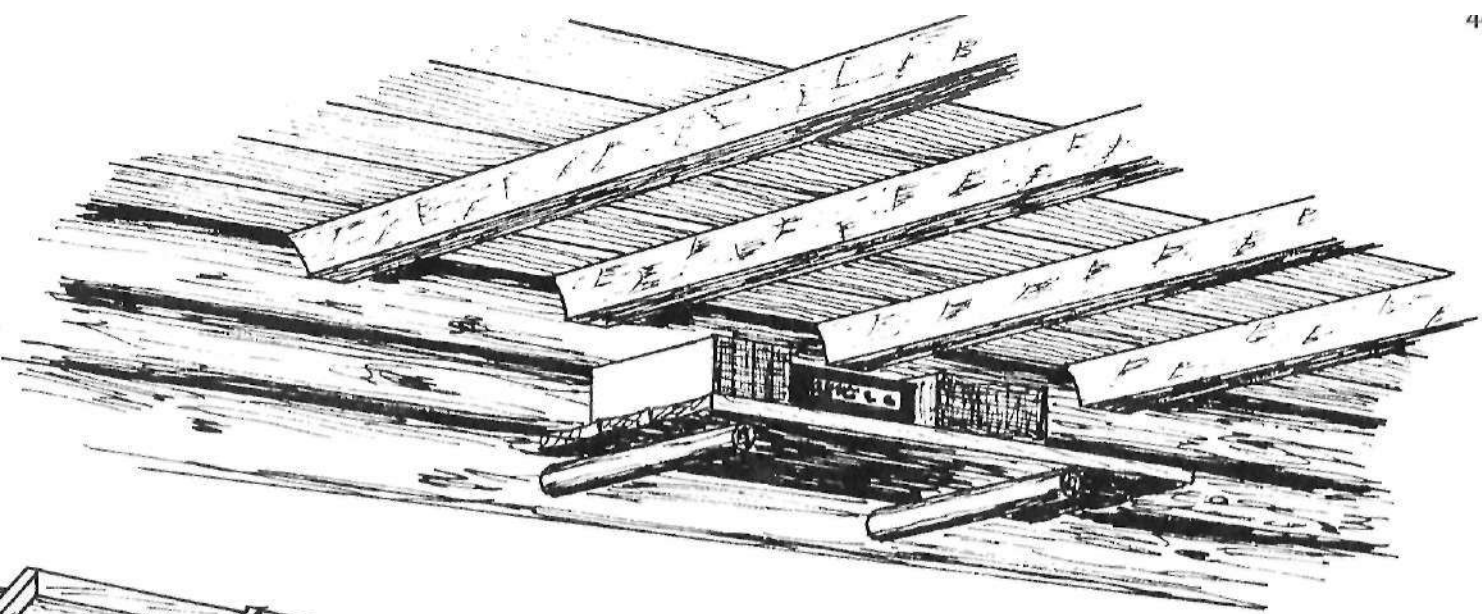
PURLINSRAFTERSGABLE END

ONE WAY TO LOCATE PURLIN POSITION IS WITH A LENGTH OF CORD MARKED IN THE CENTER. LIFT THE CENTER TO DESIRED SLOPE AND NAIL EACH END. PLACE PURLINS WIDTH OF RAFTER BELOW CORD.

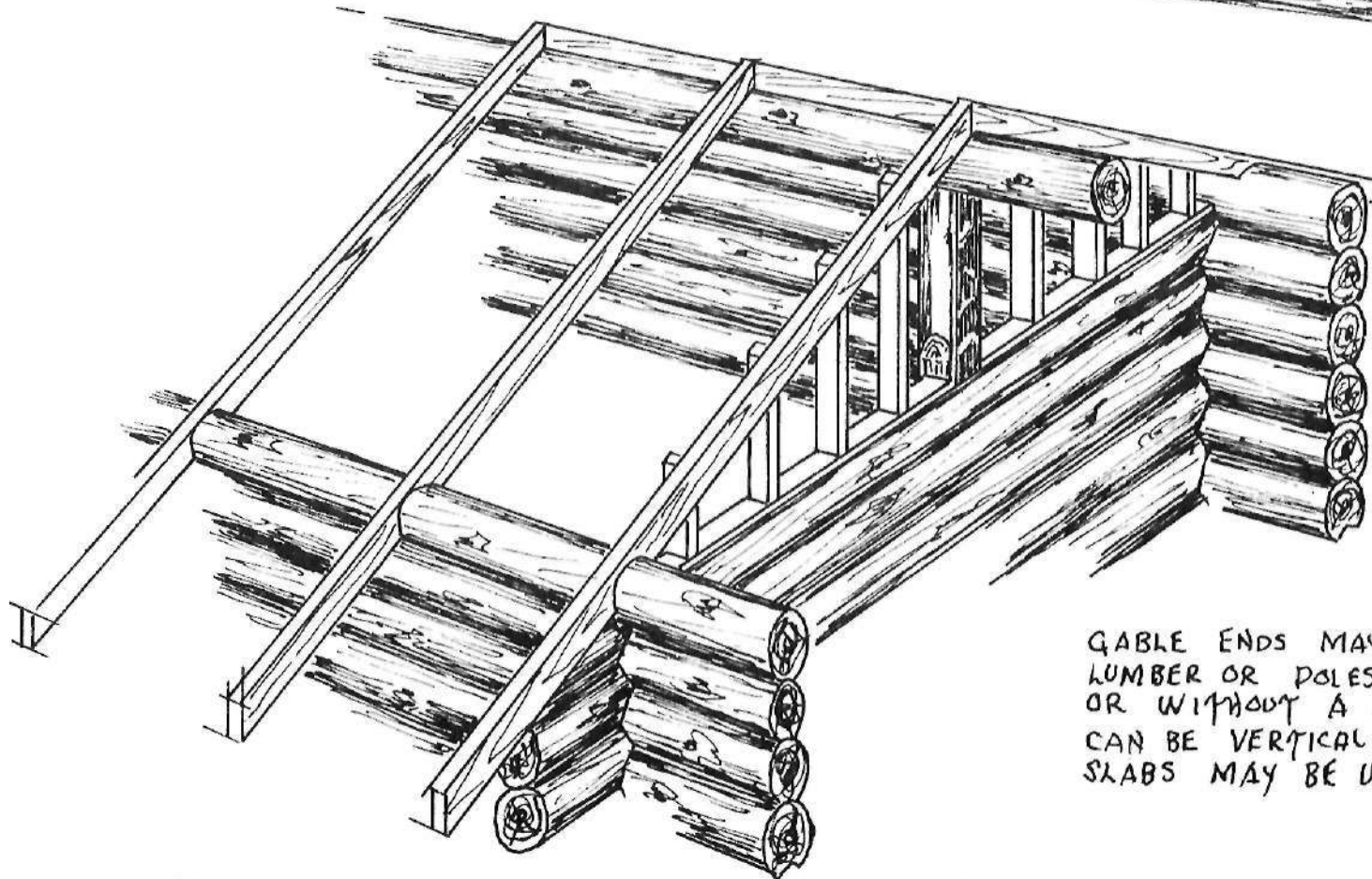


LONG ENDS OF RAFTERS LIFTED ONE INCH AND VERTICAL SAW CUT MADE AT POINT OF INTERSECTION.

CEILING BEAMS ARE
PLACED MUCH THE SAME
AS FLOOR JOISTS. HEWN
BEAMS ARE ILLUSTRATED.
CEILING PLANKS SHOULD BE
ALLOWED TO DRY BEFORE
FASTENING



CEILING and FRAMED GABLE END



GABLE ENDS MAY BE FRAMED WITH
LUMBER OR POLES AS SHOWN WITH
OR WITHOUT A RIDGE POLE. SHEATHING
CAN BE VERTICAL OR HORIZONTAL.
SLABS MAY BE USED TO GOOD EFFECT.

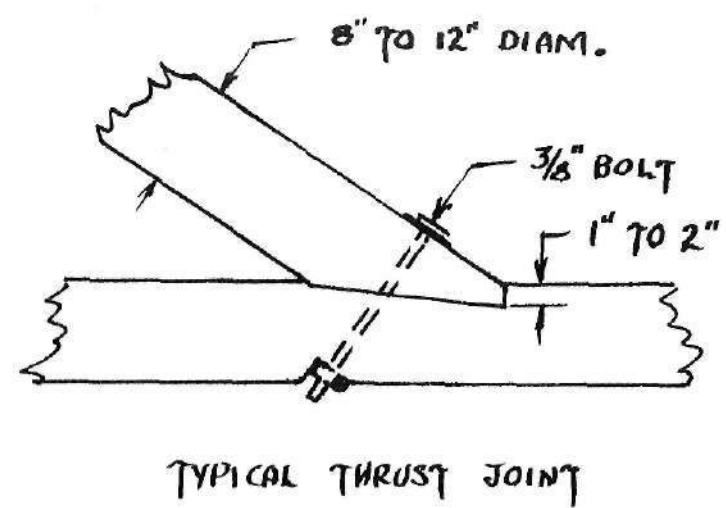
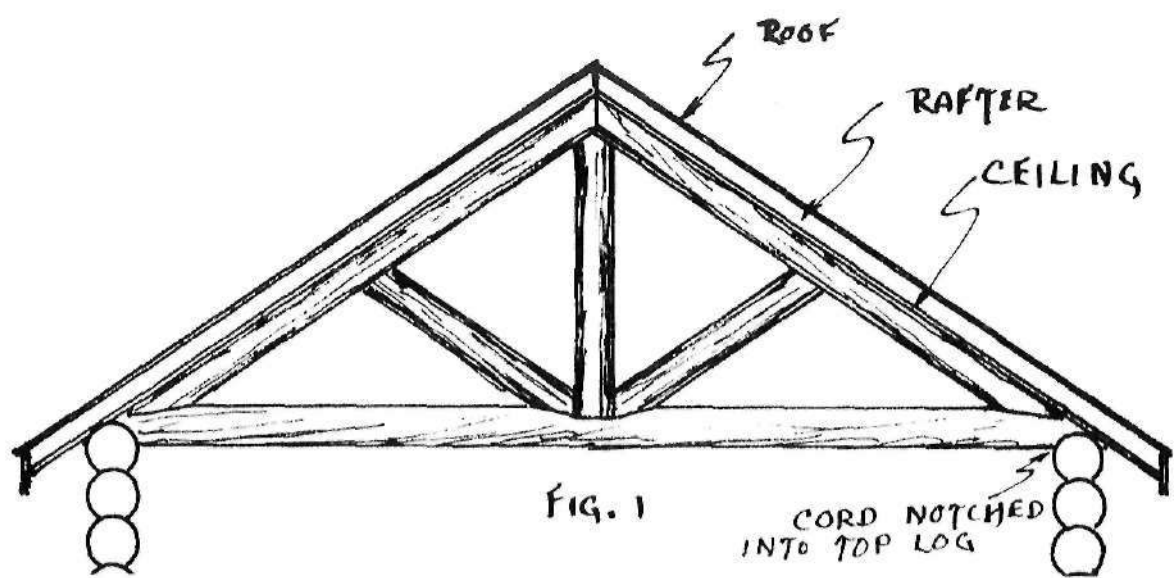
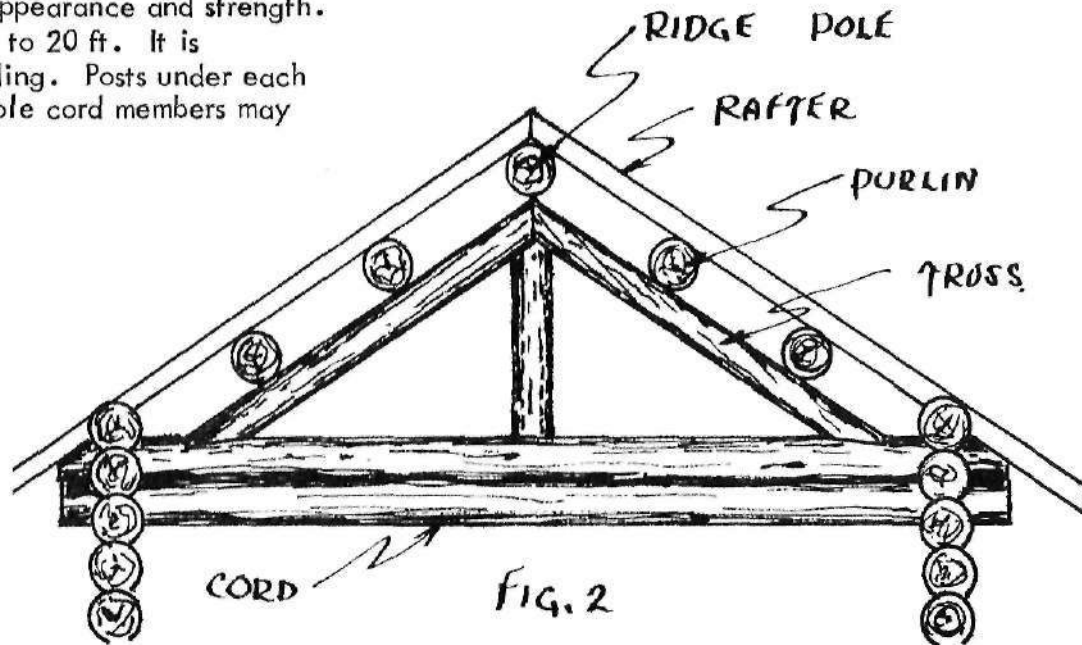
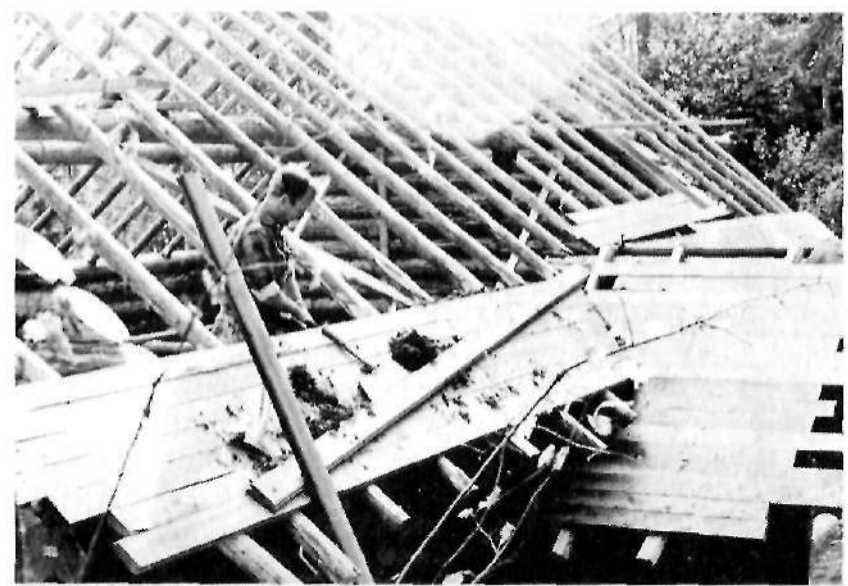
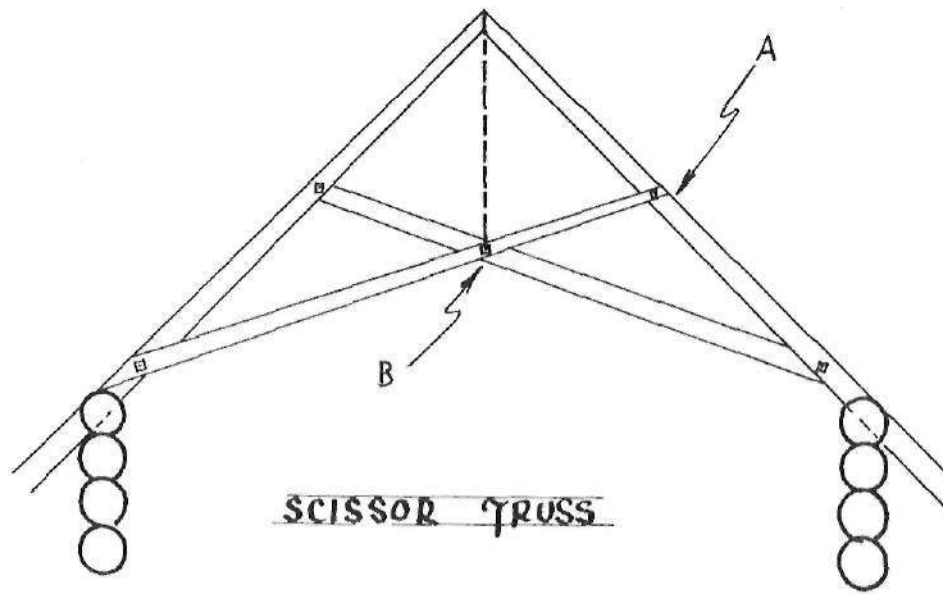


Figure 1 shows a cross section of a building with a log truss roof support. This truss could be built on the ground and used in the same manner as a nailed truss. Each truss would normally be placed 6 to 10 ft. apart. It has good appearance and strength.

The truss illustrated in Fig. 2 would be placed every 15 to 20 ft. It is tremendously strong and suited to larger buildings or heavy loading. Posts under each purlin may be used instead of diagonal truss members. The double cord members may be bolted together and a double ridge pole added.



At left: Morley New nailing 2" tongue and groove cedar decking on his home near Prince George. 2x6 planks on edge with fibreglass between were applied next, then 1x6 stripping, then hand split cedar shakes.



RAFTERS

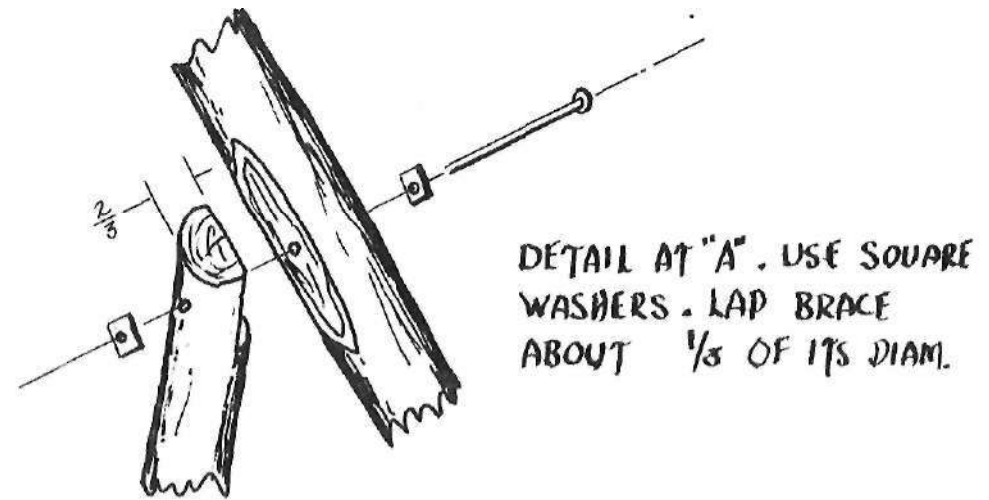
The notch in the side wall for the rafters may be cut slightly narrow at the outside (bottom) and the rafter driven into it before it is secured with a 6" nail. This will make any complicated seat cut unnecessary. The top end of the rafter is allowed to run out long over the ridgepole, then blocked up about 1/2" when all are in place, a vertical cut between the crossed rafters will ensure a good fit.

In order to align rafters or joists, position the members at each end first. Stretch a mason's line tightly between these and block the lineup about 1". Now when a rafter is positioned in between these, it will be in line when it is 1" below the line. This method will prevent the accumulation of small errors, as might be the case if each rafter is lined up with the preceding one only.

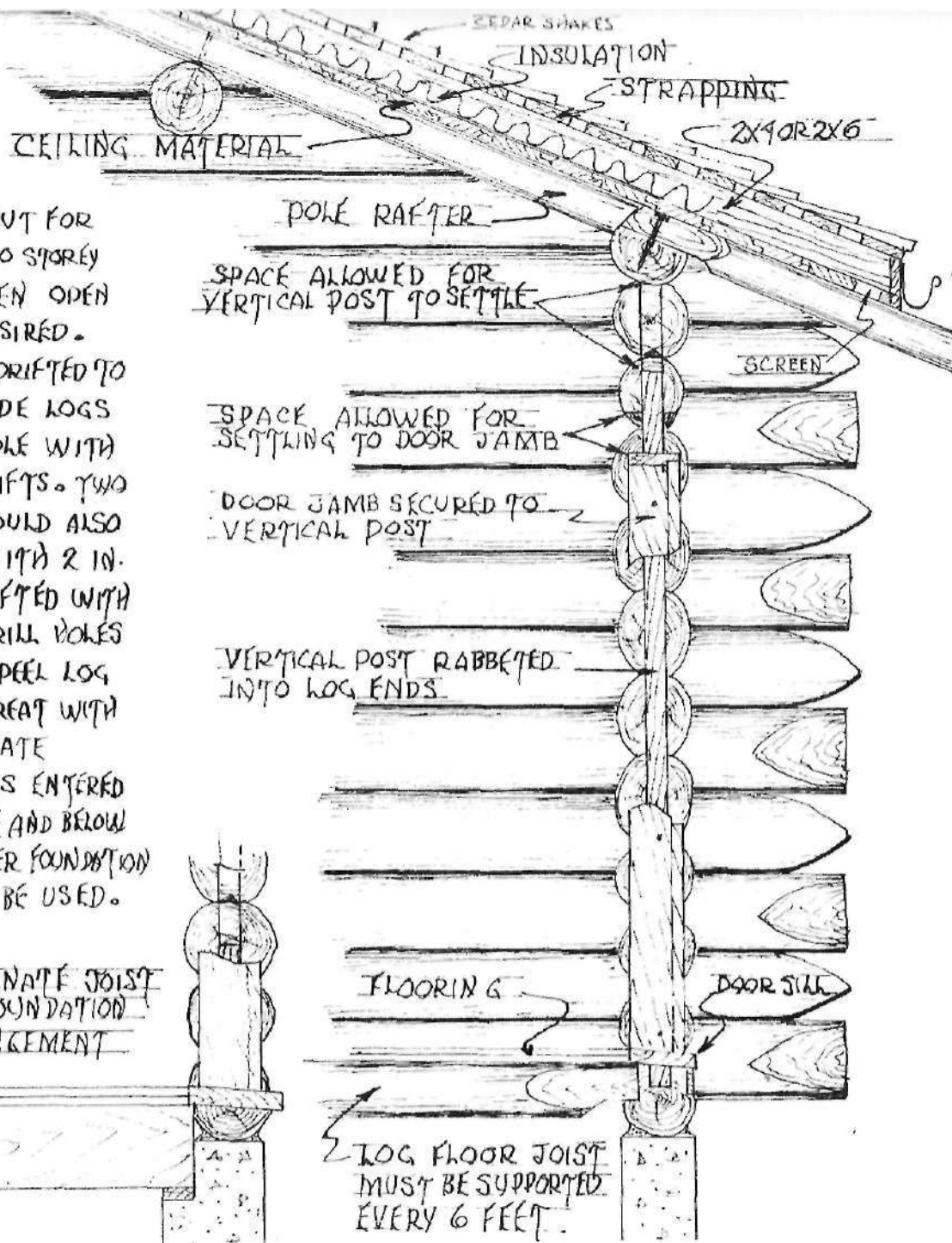
CEILING

Ceiling joists may be placed in a manner similar to floor joists. Square hewn ceiling joists give a good appearance. But consider carefully whether or not your plan requires a ceiling ... it may simply be hiding your carefully selected ridgepole.

Ceiling planks shrink excessively and, for this reason, should not be fastened down for about a year. If mineral wool batts are used for insulation, these can be removed, the vapour barrier removed, and the ceiling planks driven close together to tighten up the fitting. It would be well to leave a few extra pieces on top of the ceiling to insert into the space which the shrinkage will create.



SCISSOR TRUSS USED WHERE HIGH OPEN INTERIOR IS DESIRED AND AN ORDINARY CORD BETWEEN PLATES WOULD NOT BE SUITABLE. IRON EYE BOLT MAY BE ADDED BETWEEN POINT "B" AND PEAK.

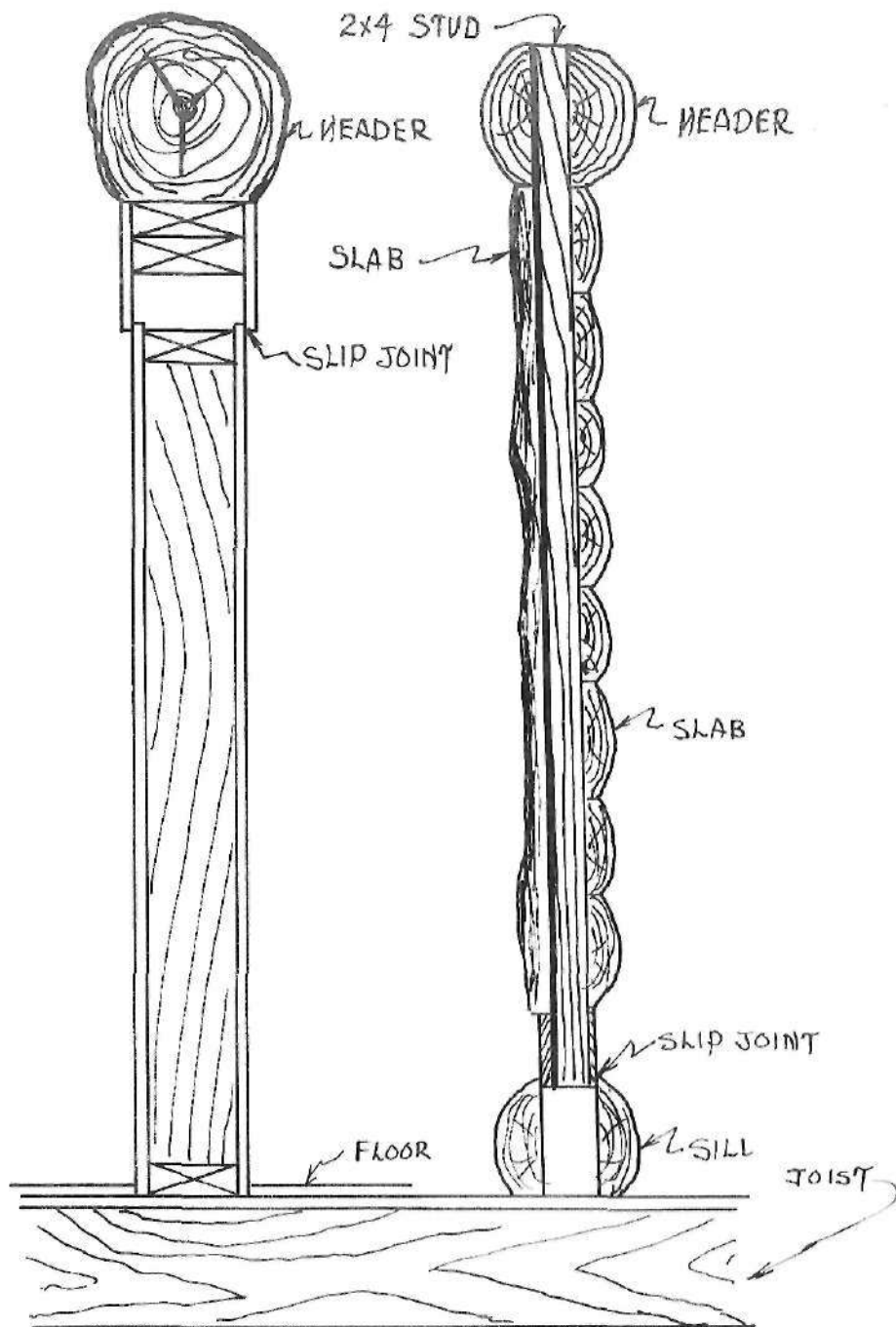


POSSIBLE LAYOUT FOR ONE OR TWO STOREY BUILDING WHEN OPEN CEILING IS DESIRED. RAFTERS ARE DRIFTED TO PURLINS, SIDE LOGS AND RIDGE POLE WITH $\frac{3}{8}$ X 8 INCH DRIFTS. TWO TOP LOGS SHOULD ALSO BE PEGGED WITH 2 IN. DOWELL OR DRIFTED WITH $\frac{1}{2}$ INCH ROD - DRILL HOLES FOR DRIFTS. PEEL LOG JOISTS AND TREAT WITH COPPER SULPHATE. VERTICAL POST IS ENTERED INTO LOG ABOVE AND BELOW OPENING. OTHER FOUNDATION LAYOUTS CAN BE USED.

SECTION THROUGH DOOR

The walls of your house are now up and you will have put in a ceiling that can be insulated or, if an open ceiling is more to your liking, the roof can be insulated.

It might well be emphasized here, the importance of good insulation. All your careful logwork could result in a cold and draughty house if cold and draught are, in fact, permitted to sneak in elsewhere. It is good to be able to put your bare feet comfortably to the floor any day of the winter. It is good, too, that the roofing does not build up heavy weights of ice at the eaves due to heat loss and melting. These and other problems can be easily avoided with good insulation. From experience I would say never use sawdust or shavings or insulating particles; fiberglass or mineral batts are best. Care should be taken that ventilation is provided. Vapour barrier goes under the insulating material. Place a screened strip the full length of the eave as close as possible to the lower end. Strapping for shakes permits ventilation between the 2x4 spacers over the insulation.



PARTITIONS

Interior partitions, if they cannot be avoided, are best made of logs and erected at the same time as the outside walls. But to save work, space or material, partitions are sometimes framed in when the building is up. There is rich opportunity here for imaginative use of materials: slabs, poles, short logs, rough-sawn lumber, or other suitable materials. For instance, Indians once made a cloth from cedar bark. Or a stone fireplace can be a pleasing division of space, with the advantage in certain plans of providing a backing and chimney for the kitchen stove. In our Southbank home, the only visible demarkation between living room area and the dining and kitchen areas was simply that of rug and linoleum. We postponed filling in the bedroom dividers for several years because of the tremendous view of Francois Lake which, without partitions, could be seen from any corner of the house. As the family grew, we relented only to the point where a bamboo window-awning could be lowered as needed.

When framing partitions in a log house, care must be taken to allow space for the settling of the building. Partitions may be made to telescope at some place, or they can be made to fit a mortised recess in a header log. Whichever method is used, the main thing is to avoid the possibility of binding of the wall, a phenomenon which has been known to lift ceilings or upper storeys or to drive the partition into the floor.

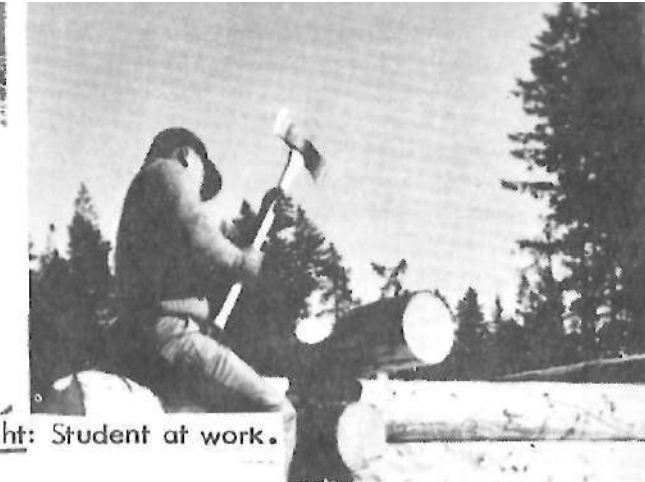
STAIRS

Stairs, too, must have ample space left to permit settling of the logs. A space allowance can be left at the bottom of the stringers, with the stringers mounted on wedges which can be shifted as needed.

Rough stairs and simple stairs are generally constructed on a sawn-out stair horse — usually from a 2x10 or 2x12 but round logs can be used to good effect. Square hewn logs are also good.

A housed stringer is the best and strongest form of stair. Each tread and riser is rabbeted into the stringer. The groove is wider at the open end so that treads and risers can be wedged into place.

Stair layout is accomplished by taking into account the total rise and the total run available, or required, to obtain this rise. Easy stairs have a 6" rise and an 8" run. Steep stairs might have an 8" rise and an 8" run. To place stairs in a total rise of 8 ft. with a riser of 6" will require 16 risers and a minimum run of $15 \times 8 = 120"$ or 10 ft. Three feet is minimal for a landing, so the available space will have to be a total of 13 ft.

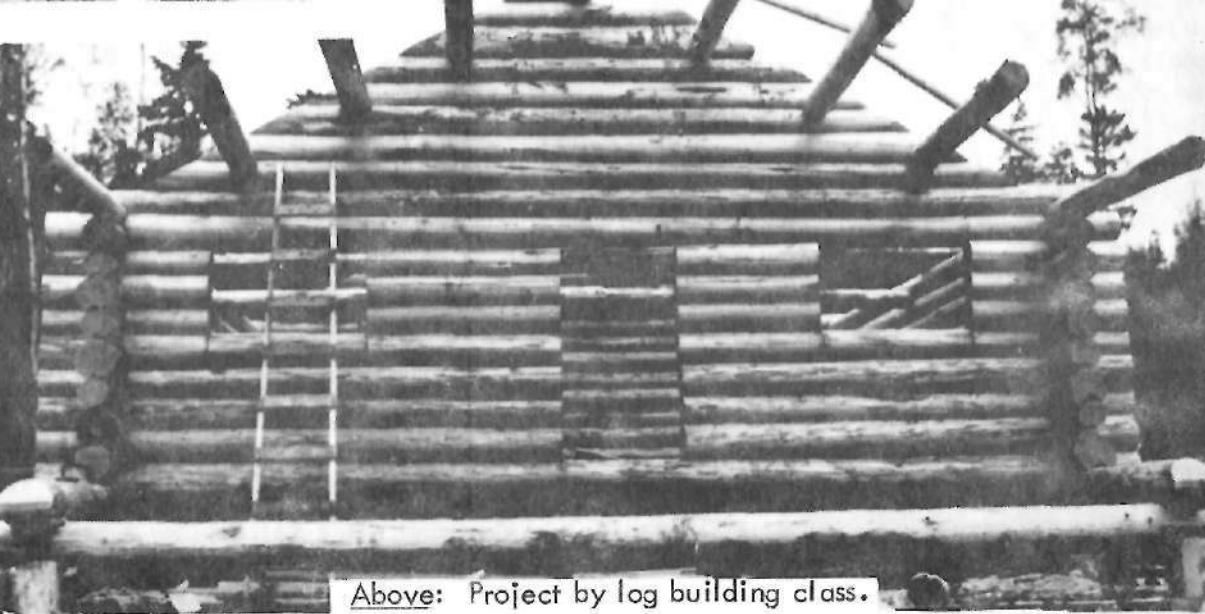


Above: Log building class (1971).

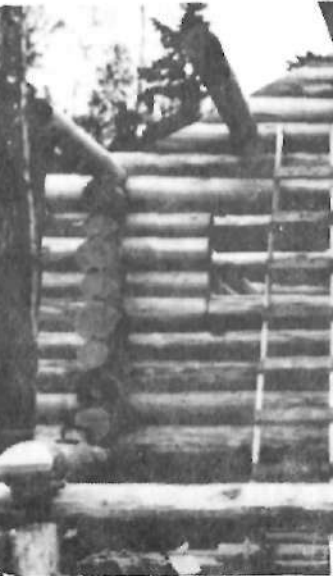
Right: Student at work.



Kids
at
work



Above: Project by log building class.



Above: Skyline Carriage which I used to put logs up on a steep, forested building site.

Below: A first try by a log building student, the Bill Duggan family residence, built for their first year at Isle Pierre, near Prince George.

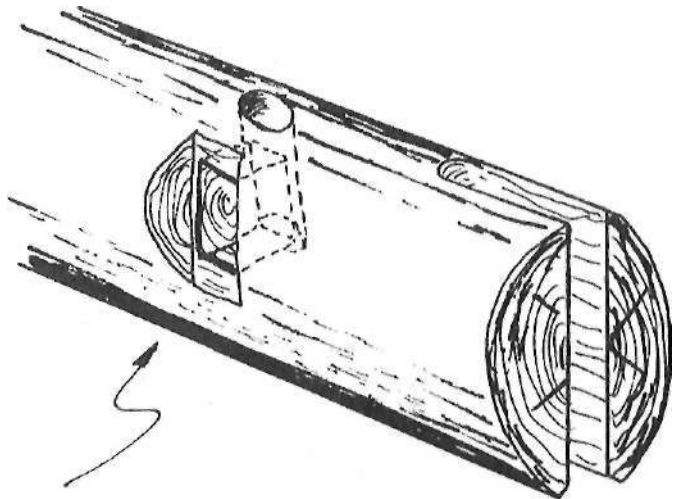
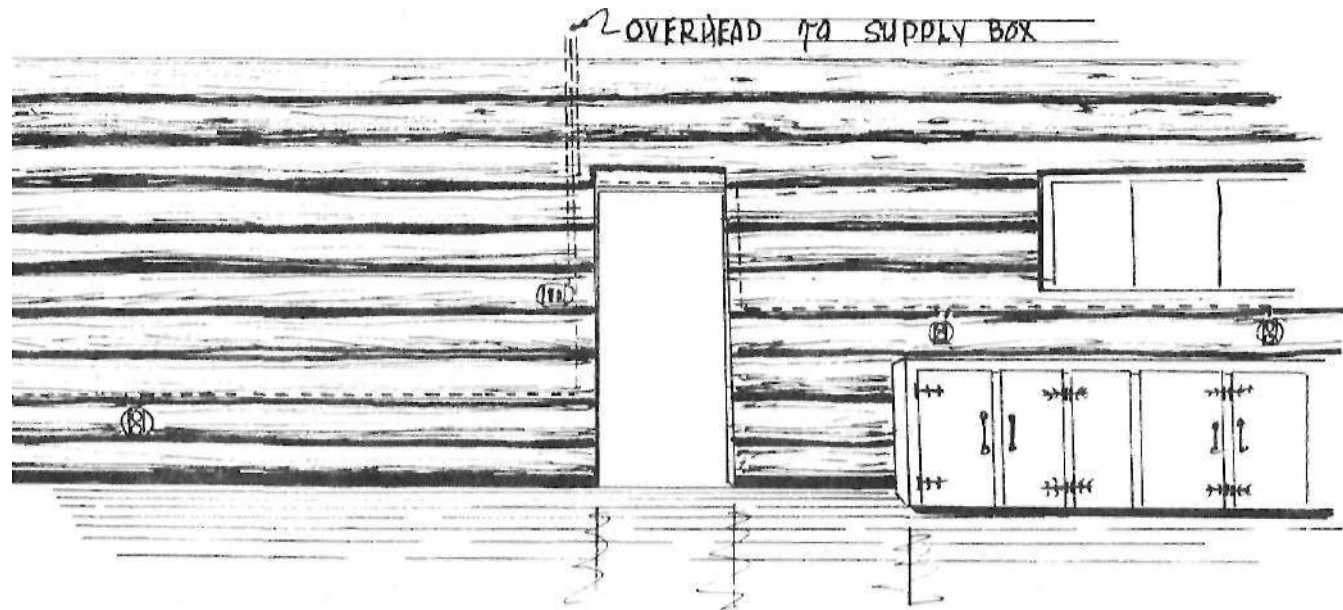


T
u
r
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O
f
f

Now and then
ask
what right
have we,
so soon gone,
to destroy forever
lakes,
rivers,
land,
to get
for ourselves
this
artificial warmth.
No, not whisky.
In our day, it's
electricity
we natives crave.

- Ida Mary Mackie



RECESS FOR BOX MINIMUM
2 x 3 1/4 BY 2 1/4 DEEP. FLAT
FOR COVER PLATE 2 3/4 x 4 1/2
USE 2 INCH AUGER.

It is unfortunate when electrical wiring in a log building has the appearance of an afterthought. Specially made coverings for wires can be used to give an unobtrusive look even in old historic buildings. But in a new building, if the wiring layout is fully planned before construction, such coverings are never necessary.

Recesses for outlet boxes are cut into a log at the desired height. The wires are pulled through the recess and stapled to the top of this log and run horizontally to either a door or a window opening, from there to be carried overhead or under the floor to the supply box. Adjoining auger holes should be drilled to accomplish this. Note, however, that the building inspector likes to see the wiring before it is covered or closed in.

A copy of the wiring code and much good advice can be obtained from the Electrical Inspector's office when you go to buy the permit needed to do your own wiring. Other books simplify matters a great deal for the layman, such as Electrical Code Simplified for B. C. by P.S. Knight.

SHAKES

Shakes are by far the most suitable roofing for a log building. They give the most appropriate appearance, are extremely durable and may be split on the site by the woodsman at little or no cost. With a proper chimney, they are no more of a fire hazard than any other roofing.

Western Red Cedar makes the best shakes but spruce, pine, fir, or balsam can also be used. Select a large tree with straight grain and clear wood. A large tree is the least likely to have knots at the butt, and it is true that the better the tree, the longer the shakes that can be split from it. So, saw the wood into the lengths that can be split most readily. Good shakes are 20 to 30" long, but are still useful if only 14 to 16" long. The rounds of wood are split into segments or bolts. Shakes should be split edge-grain off the bolt, the bolt turned end for end each time a shake is split off.

The tool used for this work is a froe — a blade about 20" long, 3" wide and 1/4" thick. A handle of 1-1/2" diameter and about the same length as the blade is secured to one end at right angles to the blade. The froe is driven partly into the cut with a hardwood mallet and the handle twisted to split off the shake. An outstanding effect can be produced by cutting very thick shakes (1-1/2") and having these sawn diagonally. The split side is then placed up and the material applied like shingles for an extremely rough-textured appearance.

Shakes are applied in double course runs, the first course being laid side by side not too close together so as to allow for swelling; the second course laid exactly atop but "breaking" (covering) the joins. The next course up is overlapped by about 2 or 3". They are nailed at both ends.

Shakes are especially suited to a steep roofed building with log gable ends. Courses can be run between each purlin and the dimensional change in the roof height due to settling is accommodated by the telescoping effect of the shakes. These, too, may be nailed at each end since the shift for each run is very little.

FIREPLACES

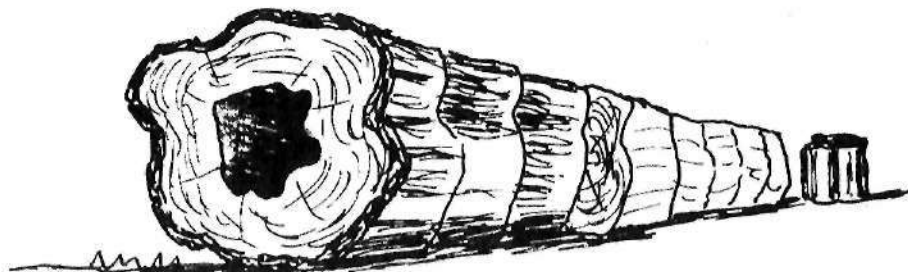
Such great variety is possible in the exterior design of fireplaces that each builder will want to give much thought to what may well turn out to be a family focal point. My feeling is that a fireplace in a log house is nearly as essential as the roof. Not only does it burn the chips occasioned by the construction, but it also supplies a surprising amount of heat. The open flame seems to satisfy some basic human need derived, perhaps, from the security of the open fire burning at the entrance of the ancestral cave. For good reasons, then, let the material and design be a matter of your own careful choice. Linger over this part of your house plan.

But the building of the functioning interior regions of the fireplace is a different matter. The need for an open fire may be inherited but chances are that the know-how was not. A skilled stonemason can build any style of fireplace and it will send the smoke up and the heat out. The amateur mason must study some basic rules, too, if he is to acquire the knack — and avoid the possibility of the heat going up and the smoke coming out and the masonry coming down. Perhaps the best advice to the amateur mason is that he buy one of the sheet metal fireplace forms available from hardware stores. These are simply a lining around which the stonework is done and, as these usually have arrangements for air circulation, this increased efficiency will more than justify the cost. There are many instant fireplaces on the market, too. Most of them work quite well if the chimney is carried about 2 ft. above the roof line.

ability to work with logs can be cashed in to be able to work with stone and mortar. But if you are cashed in to be able to work with stone and mortar, be assured that if you have the

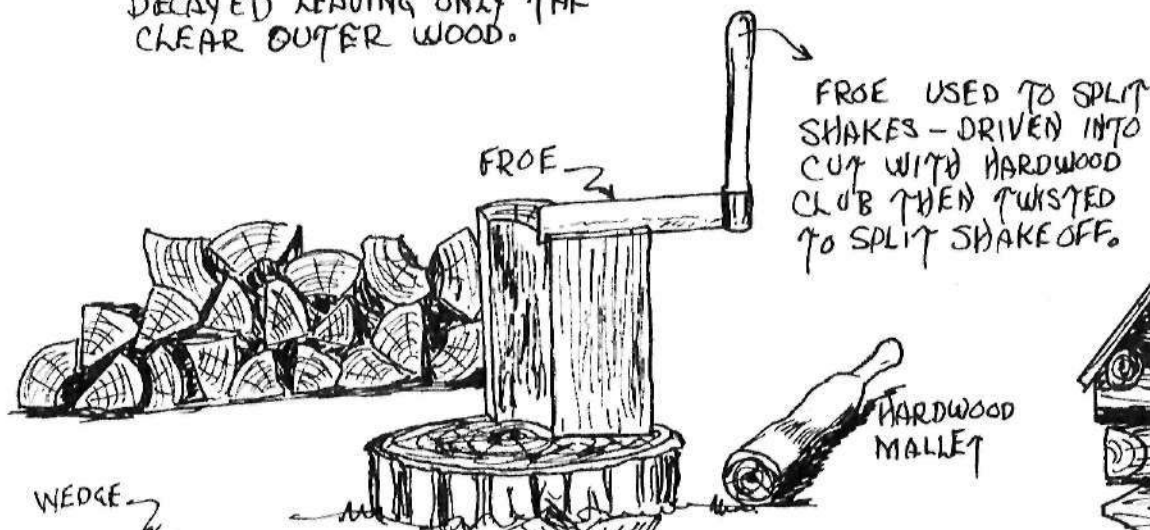
SHAKES

STEEP ROOF



LARGE LOG CUT INTO LENGTHS
TO BE SPLIT INTO SHAKE BOLTS.
WESTERN RED CEDAR IS BEST.
IN THIS ONE THE HEARTWOOD IS
DECAYED LEAVING ONLY THE
CLEAR OUTER WOOD.

STEEP ROOF WITH LOG GABLE
USING PURLINS AND SHAKES.
DIMENSIONAL CHANGE OCCASIONED
BY SHRINKAGE & SETTLING IS
TAKEN CARE OF BY TELESCOPING
EFFECT.



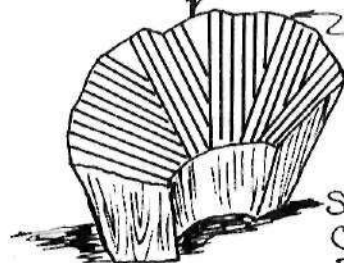
FROE USED TO SPLIT
SHAKES - DRIVEN INTO
CUT WITH HARDWOOD
CLUB THEN TWISTED
TO SPLIT SHAKE OFF.

FROE

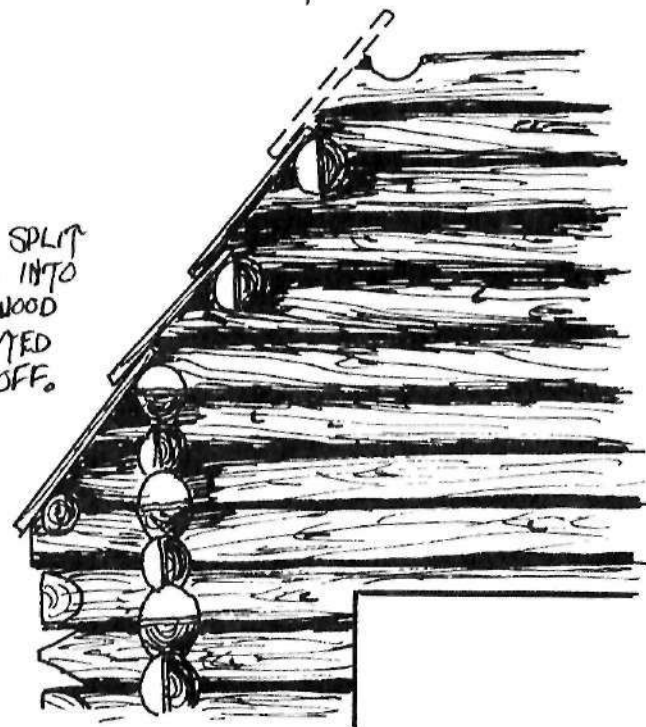
HARDWOOD
MALLET

WEDGE

POSSIBLE
CUTTING
PATTERN



SHAKES $\frac{5}{8}$ INCHES THICK. WEDGE
CUT AS REQUIRED TO SQUARE
BLOCK - TURN BLOCK END FOR
END EACH CUT TO ASSIST TAPER.



SHAKES USED IN STEEP ROOF CONSTRUCTION.
SHAKES MAY BE DIFFERENT LENGTHS OR
THICKNESS AS REQUIRED FOR SPECIFIC
PURPOSES BUT ARE GENERALLY $\frac{5}{8}$ THICK
AND 20-30 INCHES LONG

Pour a substantial base when the foundation is laid. This footing will be about 1 ft. wider all around than the proposed dimensions of the fireplace. If the ground is very soft, go deeper and wider. The following table is a guide for various soil conditions.

CLASS OF FOUNDATION DRAINAGE		TYPE OF SOIL			
		ROCK	GRAVEL	SAND	CLAY
Good	Heated Basement	No limit	No limit	No limit	4 feet
Poor	" "	No limit	No limit	No limit	4 feet
Good	Not heated	No limit	No limit	Below frost	Below frost, minimum 4 ft.
Poor	Not heated	No limit	Below frost	Below frost	Below frost, minimum 4 ft.

A solid base is the prime requirement of a good fireplace. A raised hearth has some advantage in cutting down floor draught, but should be reinforced with steel. If the building has a basement, an ash drop door can be purchased and installed in the hollow fireplace base so that ashes are removed from the basement level, otherwise the ash drop door can be placed so that ash removal is done from the outside of the house.

A suitable mortar for masonry is (by volume) 1 part masonry cement and 2-1/4 to 3 parts mortar sand in damp, loose condition; or is 1 part Portland cement (type II), 1/2 to 1-1/4 parts hydrated lime and 4-1/2 to 6 parts mortar sand. Workability is obtained through proper grading of sand and thorough mixing. If work is to be done in hot, direct sunlight, some provision must be made to prevent rapid loss of water. Use a flue liner above the fireplace form and then it is only necessary to "stack" rock around the whole thing to get a workable fireplace.

If you are building the entire fireplace yourself, the following rules may serve as a guide:

1. Flue size depends on the size of fireplace opening. Minimum size is one-tenth of the area of the opening but never less than 8x12".
2. Front of the fireplace should be wider than the back and upper part of the back should tilt forward to meet the throat.
3. The vertical portion of the back should be about one-half of the height of the opening.
4. The back should be two-thirds of the opening width.
5. Build a smoke shelf to reduce back draught, this is formed by projecting the throat as far forward as possible.
6. Throat should be as wide and shallow as possible but contain the same area as the flue. Obtain a well-designed damper from the hardware supply.
7. The sides of the fireplace are drawn together above the throat to form the flue but the slope should not exceed 45° to the vertical.
8. The firebrick should be 2" thick and laid with fire clay mortar or high temperature cement.
9. The back and sides of the fireplace should be 7-1/2" thick for walls built of solid masonry or 12" thick when hollow masonry or stone.

Place the entire fireplace within the walls of the house when possible. The chimney will draw better if it is warm and this mass of warmed masonry will keep your house from freezing if you are gone for a few days in midwinter.

Whether the chimney is inside or outside the walls, care must be taken that the walls do not hang up on the stonework. Frame the fireplace opening the same as a door or window opening, so that there is room at the top for the walls to settle. The chimney may be tied to the wall with crimped, galvanized metal tie straps that will expand or stretch if the wall settles. But the chimney should not depend on the wall for support.

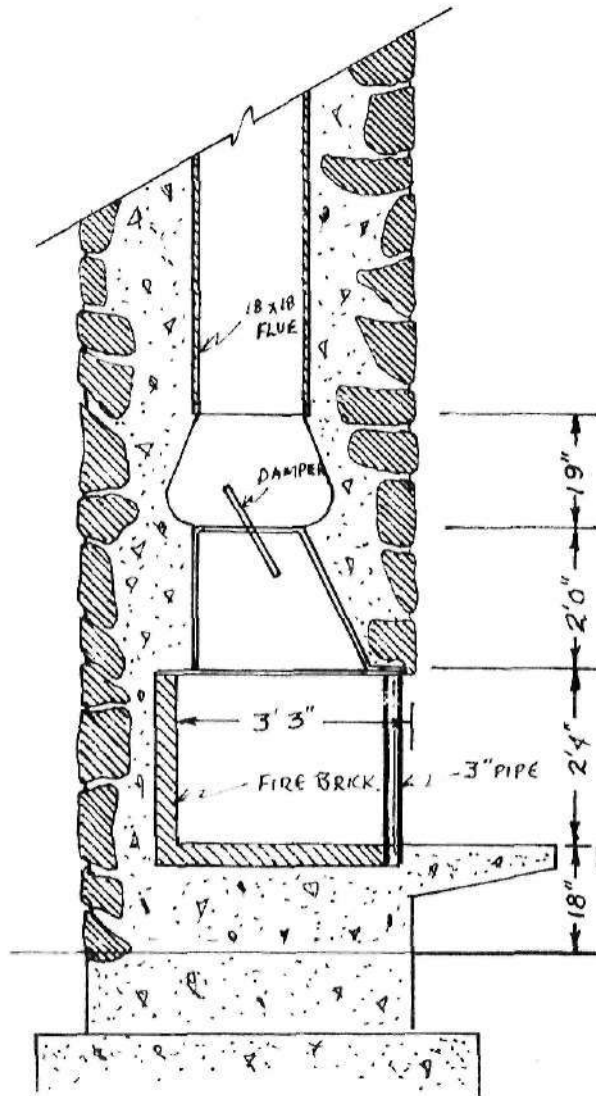
Use flashing between the roof and the stonework and leave 2 or 3" space between the roof material and the chimney. Cap the chimney with a sloped concrete slab through which the flue liner should protrude 1".

For the first try at fireplace building, it might be better to choose square-faced rock rather than field stone. Rock can be cut and some people lay the rock out on the floor to a full scale outline in order to fit the desired pattern. By this means a particular colour pattern, even figures, can be incorporated in the face of the structure. Good luck!

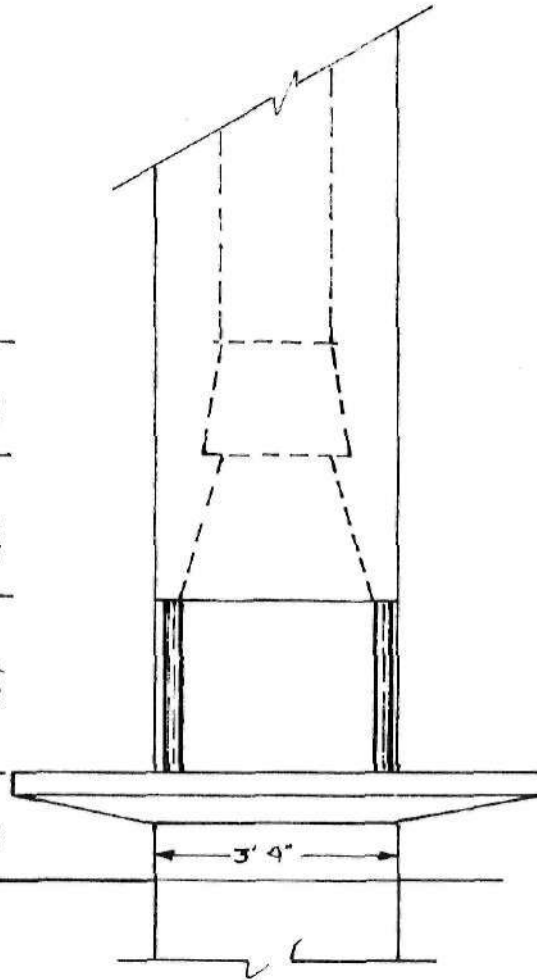
2 FIREPLACES

SCALE $\frac{3}{8} = 1$ FOOT

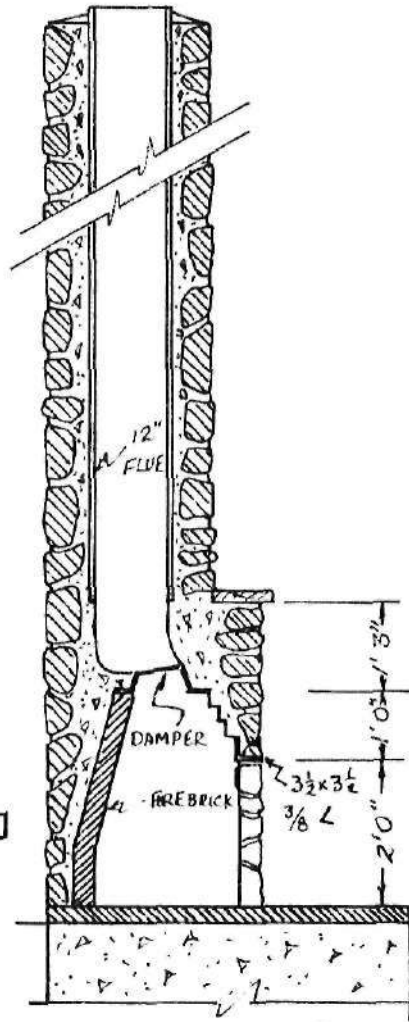
SECTION #1



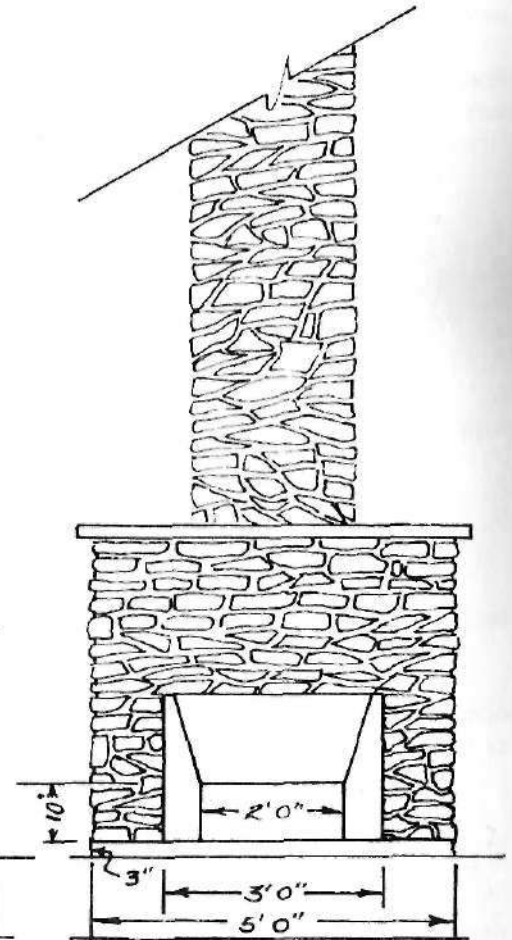
ELEVATION #1



SECTION #2

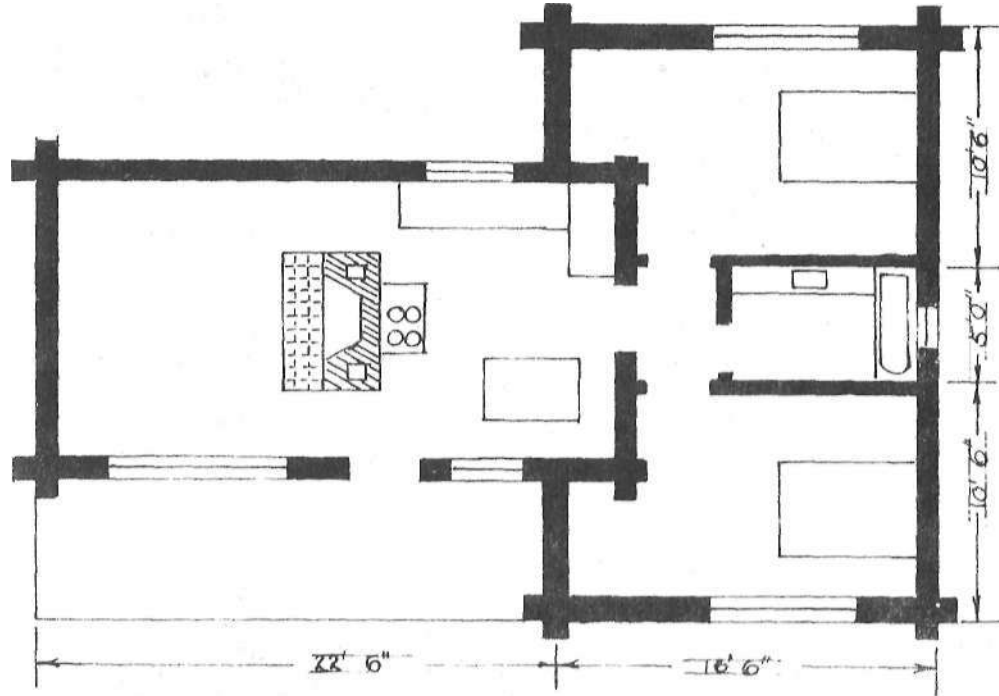


ELEVATION #2



THE GUEST HOUSE

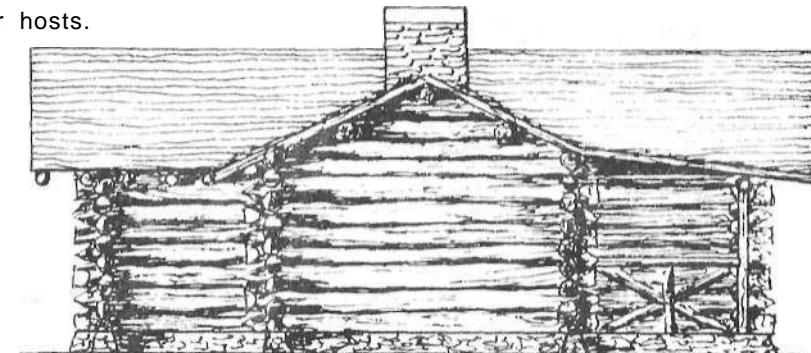
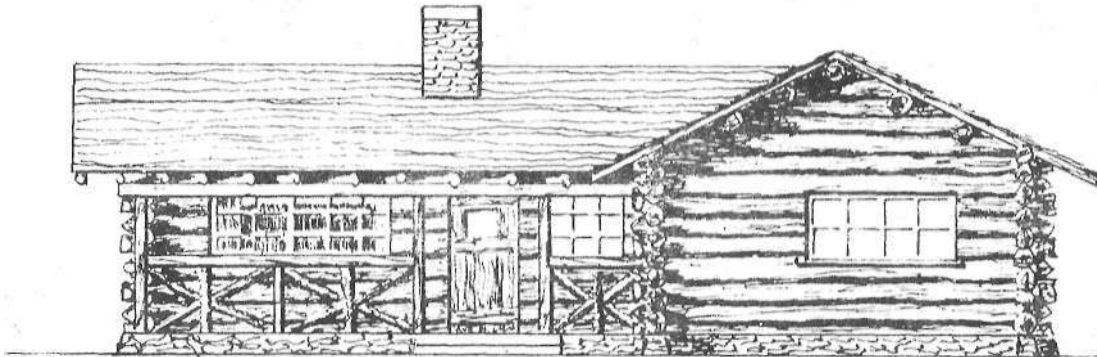
There is a great deal to recommend the small, separate house. Perhaps the most important point the student-builder should consider is the valuable experience it offers him, in preparation for a full-scale log house. On a small building, the logs will be a little easier to handle. If errors are made, these too will be smaller ones and easily corrected before the more serious construction project begins. So much can be learned from a first try that I'd recommend building even a doghouse except for the fact that no dog of my acquaintance would inhabit such a solitary and unheated edifice. Even the most experienced log builder can often be heard to say how he'd like to build another house (and another, and another . . .) in order to apply the insight gained on every building. But this is never more true than on the first house.



There is also the economy of a small separate house, if it enables the family to move into a debt-free home for the first year. Some builders rent a mobile home or camper so they can move onto the site to work, but this can run to a surprising amount of time as well as expense to shop for, move, prepare a site for, and hook up this kind of mobile shelter and afterward nothing is left but a bare scar on your land and a debit in your savings. So even a speedy and none too painstaking job of building a cottage will leave something to be enjoyed later as a permanent improvement to the property. It becomes, for you, a truly historic site where your estate began.

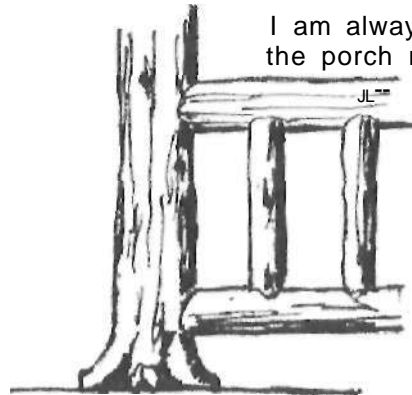
A teenager can find, in such a cottage, the beginnings of independence. Midnight oil, trumpet practice, and bad house-keeping become almost unnoticed if the youngster isn't obliged to be too close to the family at all times. I think many a young person would return home, in later years, if he could remain his own boss in his own former hideaway.

Guests also feel much more free and comfortable in a separate cottage where their comings and goings cannot disturb their hosts.



FINISHING TOUCHES

Everything I have described, up to this point, has been intended to help the builder create a home as solid and durable as a fortress. I have hoped that the builder would question all frills and discard from his houseplan any door, partition, certainly any trim or other intruder which could not account for its presence in terms of comfort, convenience, or structural necessity. Beauty in a house is space ... space that is uncluttered, well used, and dramatized. But now is the time for door handles, stair railings, coat pegs, and a bit of fun.



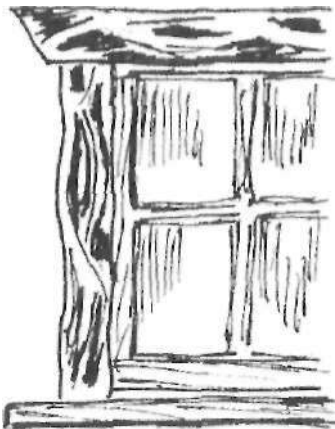
I am always surprised by the sudden blossoming of even the plainest log building when the porch railings and other fittings start to go into place. This is when the chorus of encouragement will increase noticeably, causing the axeman to wonder how he came to miss harnessing such enthusiasm to a peeling spud some months earlier.

Straight young poles will form the bases of most railings and trusses, but there are many twisted and kinky roots and branches and trunks of trees which will lend themselves to special needs.

Be guided by a feeling of respect for the tree as a living thing, and simply acknowledge that in providing a certain fork or curve, the free is a uniqueness deserving to be fitted with care as naturally as possible. For example, I saw an altar rail in a church formed, as sketched at left, by preserving the root crown of the free to serve as footings for the posts. Root bends were used as braces for the belfrey of this same log church and short lengths of matched poles

framed and outlined the archway of an alcove. The builder's feelings of reverence toward nature are clearly reflected in such chosen pieces.

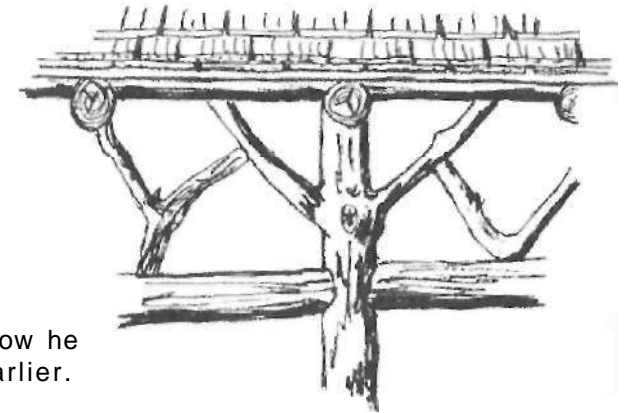
Snow can provide a delightful finishing touch to a snug and well-built home, yet rarely is a Canadian house designed for this embellishment. Most contemporary dwellings appear to have been designed for countries where snow is unheard of. The results can be interesting, as a friend of mine knows — he lives in a subdivision where every winter he receives free, delivered right to his doorstep, the entire snowpack off his neighbour's sloping carport



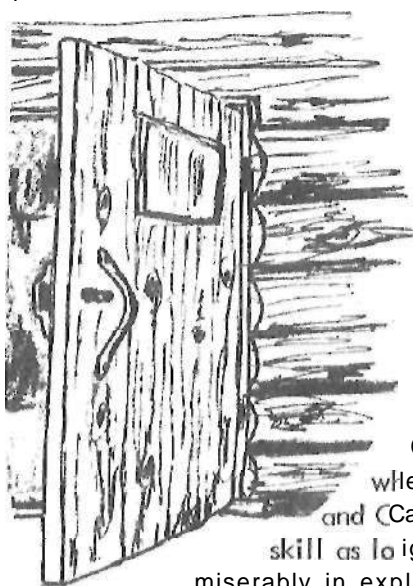
roof. But, on the other hand, there is a graceful example of snow design in an older home on 7th Avenue in Prince George, probably built in the days when workmen put more soul into their buildings. This house has had the peak of each gable exaggerated, somewhat as sketched at right, giving the appearance of mighty ships cleaving the snowpack as they would the ocean.



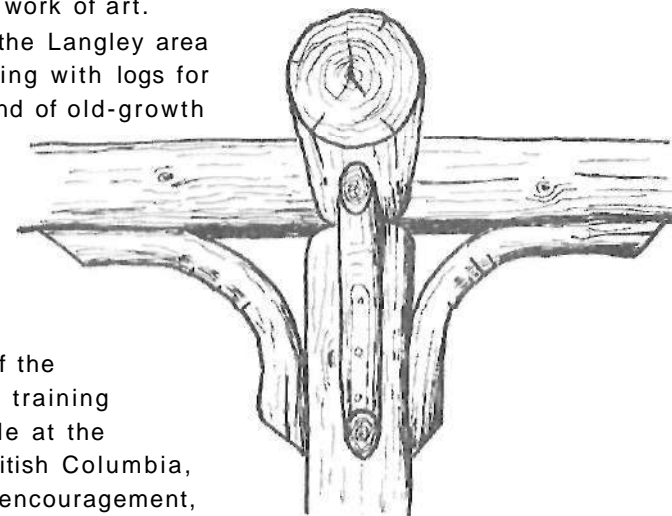
An ornamental wood, highly prized, is diamond willow as shown at left as window trim. Diamond willow is simply willow that has been injured, perhaps by moose browsing, and later forms these unique patterns. Another ornamental wood sometimes incorporated into railings or furniture is the burl (an abnormal outgrowth occasionally



on the trunk of a tree). I have personally never been able to use burls. I find them as disturbing as any other kind of suffering and am uncomfortable*? in the displaying of a tree's deformity. To me, a smooth and healthy bend of wood fitting perfectly to the grip of my hand, never freezing to the skin as a metal doorhandle does, this is a satisfying thing. Or a stout curve that forms a knee brace, as shown at right, below. The log builder knows the pleasure of an artist when he finds in these things the right size and shape of material to create his work of art.



There is a story I like, concerning a fine log builder who lives in the Langley area of British Columbia. He had seen many a tree, having been building with logs for 50 years. But on this occasion, he had been offered a 2-acre stand of old-growth Douglas Fir which had grown on level ground under ideal conditions and, as a result, were straight as arrows, of uniform 14 inch diameters, with only a few branches at the tops. When the old log builder saw these trees, in all their perfection, he ran from one to another, throwing his arms around their trunks, hugging them for joy. This, I understand.



Before ending this book, I should perhaps try to answer some of the questions I am receiving from all parts of Canada, concerning the training possibilities for the professional log builder. Courses are available at the College of New Caledonia, 2001 Central Street, Prince George, British Columbia, where I teach. The College has given my work continuous support and encouragement, and Canada Manpower is also willing to sponsor students who intend to learn the skill as longterm employment. Because I believe that we, in Canada, have failed miserably in exploring the architectural excellence possible with our timber, I sincerely

hope that more and more of the most vigorous, gifted, and dedicated men will undertake training as log builders. I feel that no time should be lost in preparing builders to a standard of professional competence where they would be able to select their own standing trees and fall them without forest damage, they would know how to fit those timbers into the walls and roofs of buildings as precisely as a ship's timbers are fitted, they would have the artistic judgment and energy to put outstanding logs to the finest possible use and, of course, they would meet all requirements of the National Building Code. As a pilot project to answer some of my own questions, I hired a young man last October whose ability was clearly exceptional. In four months, this trainee completed one of the best jobs of log building I have ever seen (a sample of which is shown at right). Working with fir, which is tough and more difficult to work with than cedar, pine, spruce, etc., he produced a large 3-bedroom, split-level house with two balconies. Tom Heintzman is now ready to work anywhere as a professional log builder.



The life of the log builder, from a personal standpoint, has a great deal to recommend it. It is the most flexible, independent line of work possible — for, once the builder has created a log building it becomes known far and wide, and requests for his work will follow. He never need worry about where his next job is coming from. He sets his own time to do a building. He can be free for long periods if need be. Of prime importance is the fact that, when he works, he is creating a valuable work of art. Recognition is a reward in itself. So is the personal satisfaction of work where no two products are ever alike. As for wages, the log builder is extremely well paid — the more so, according to his skill. One first-rate log builder in the Burns Lake area, as an example, charges \$5,000 for the logwork only(walls, purlins, ridgepole, doors and windows) of a simple rectangular building roughly 30x40 feet, the owner supplying all materials including the logs, and completing all other aspects of the building himself.

Another item, before ending this book: when I think of timbers as building materials, I think of magnificent buildings. Some I have already seen, during my travels on the Canada Council study of log buildings. There is the enormous Chateau Montebello (the former Seigneurie Club) in Quebec built only 40 years ago by a crew of 3,500 log builders. Or the small but beautiful pine log church at the St. Laurent mission of Notre Dame de Lourdes near Batoche, Saskatchewan. And the soaring hammerbeams of the roof of St. John's Anglican Church at Lunenburg, Nova Scotia. The massive and formal timber frame buildings being reconstructed at the Fortress of Louisbourg. But some of the magnificent log buildings I have not yet seen, they are yet to be built — but all the same, this is how I think of buildings created from Canadian timbers. Therefore, it has become a matter of great curiosity to me, how the word "cabin"¹ ever managed to fix itself, leech-like, to the word log now and then. My research is far from complete, but one thing is clear — many people never use the term at all, while others use it compulsively to refer to all log structures. For example, I have architect's drawings for a 5-bedroom, 5-bathroom house complete with servants' wing, titled, TEN ROOM LOG CABIN! Roget's Thesaurus offers me words like hut, hovel, and shack as synonyms for cabin and I agree. The Oxford Dictionary of English Etymology gives the meaning of cabin as hut, tent, booth, cell, cave, den, compartment in a ship, rude habitation. I find it proper that neither cabin nor log cabin appear at all in the Dictionary of Canadianisms. Webster's Third Unabridged Dictionary, way down the list of huts and airplane compartments, gives cabin as meaning a temporary shelter, and a small one-story low roofed dwelling of plain construction as a 4-sided dwelling of logs built as a home by early settlers of the western frontier of north America or by mountain folk, or a similar structure serving as the home of a family of a servant or plantation hand in the south. Thus, in no way can I see that this term is suitable for a fine log building. In fact, I have come to wonder if the use of this downgrading term may have done greater disservice to the possible study of log construction techniques than poor workmanship ever did. What ambitious architect in his right mind would commit his career to the specialization in log "cabins" ... for who would take a cabin seriously? Imagine going home to the ancestral cabin. Or a dinner invitation to a fashionable town-cabin. Moving Into a sophisticated urban cabin. Being impressed by a municipal or federal cabin. Stopping off at the Empress Hotel Cabin or the Chateau Montebello Cabin. These impossible concepts have, I suspect, been imposed unwittingly upon a most beautiful and desirable building form. Needless to say, the word "cabin" sends a shaft of pain through me, whenever I hear it, for I believe that Canada is, even yet, in a rare and privileged position to produce magnificent and monumental log buildings from the good timbers we — and few other nations — still do have.

I would like to thank the many readers who have written to me with information concerning the acquisition of broad axes. Most letters told of a single axe that could be purchased, but several gave the address of a hardware store still providing broad axes and other woodsman's tools. This is Paine Hardware Limited, 90 Lonsdale Avenue, North Vancouver. When I checked with them, a broad axe less handle was selling for \$36.95.

Perhaps a book, like a house, needs a finishing touch. The problem with a log building book is that, like the craft itself, it is never quite finished. For example, recently I was shown a stand of pine which had been killed by a swift-moving fire. The wood underneath the blackened bark had turned bright orange and the bark beetles had already laid their eggs under there. By spring, these trees will be wildly coloured, patterned, and seasoned. An extremely interesting house is being planned, using them. By this time next year, we'll know how it turned out.

But if I knew, as someday I surely must, that I had to put the last finishing touch to my work for all time, my wish above all would be to know that I had helped Canadians find a way to build the most Canadian of homes, on their own land, indebted to nobody — in short, to inherit their birthright. The Riel rebellions ought to have told us something of this. To me, a most interesting feature of that territory of the South Saskatchewan River where the 2nd rebellion occurred is the wealth of ancient log buildings. Mostly deserted now, and built of available poplar, the skill and care of the builders was such that they still stand straight and true. Their vision of a new nation lives on. But if their dream is to be saved, I think that — like the Metis, the buffalo, the trumpeter swan, the sea otter, and the tree — the Canadian also needs some defense against crowding and encroachment. The sale of land to citizens of other nations must be halted. And before zero population growth is considered, surely the inflow of immigrants must be measured sanely. And a resource policy should not only make better use of our raw materials but should keep the proceeds from our resources here, in this country. This seems a necessary basis if young people are to have the right, if they so desire, to claim freely some portion of their native land and, on it, to build their homes and live, independently, at peace with nature.

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BUILDING WITH LOGS

CNC plans log house on serviced city lot

The College of New Caledonia will offer an expanded course in construction with logs this fall, 1973. The enlarged course, approved by college council at a meeting July 20 will have students under instructor Allan Mackie build a full-sized, fully-serviced log house on a city lot to be purchased by the college. When completed, the house will be sold to cover expenses.

Principal Fred Speckeen said Mackie has been given the opportunity to build log houses for developers but would prefer to continue working at the college. Most of the basic work on the house will be done by students. Speckeen said excavating and the construction of cement foundations can probably be managed by CNC students but that wiring and plumbing may be left to local tradesmen. In addition, students from the college's Construction Technology course, to be inaugurated this fall, will be exposed to the work. The course deals with surveying, blueprinting and other skills of construction technology.

The new log building program will be financed through the Central Mortgage and Housing Corporation but will be started with funds from the college budget. It will run for two semesters, or about eight months. Speckeen said the house will be sold at a realistic price. If any profit is made, the money will probably be put into a student scholarship. But Speckeen cautioned the college does not expect to make money on the sale of its log house. Because building of the house will be a teaching situation, the work will not progress as quickly and economically as it might if done by a contractor, he said.

CNC instructor to study log houses

Allan Mackie, a College of New Caledonia logging instructor, has been awarded a \$4,000 Canada Council grant to study the history of log building to Canada. Mackie is probably better known as the author of Building with Logs, a book on the construction of log houses. His decision to research the development of log building stems from a visit he and his wife made last fall to Batoche, Sask., near the battlefield of the second Riel rebellion. They were impressed with the beauty of a shrine to Riel, a church built of pine logs, said Mrs. Mackie.

The craftsmen had been guided by the natural forms of the wood. Root crowns, for example, were footings for an altar rail. Priests there did not appear to know anything of the history of the building, she said. In his book Mackie gives a brief example of sequence of log building styles. He has a photograph of a trading post built at Fort St. James in 1806. It was built for the North West Company, a fur-trading firm from Montreal, in the French method of piece-en-pie, a type of construction that slots together relatively short logs.

In 1821, writes Mackie, after the North West Company was absorbed by the Hudson's Bay Company a clerk's house was added to the Fort St. James post. It was built by a Scot, "using quite a different style."

The Mackies' research will probably start in Quebec. Design, types of timber, log building skills and the effects of time and climate will be studied in areas of early settlement to Canada. Archives of the Catholic Church, the RCMP and the Hudson's Bay Company will be searched for additional information. The end result should be a book tracing the development of log building, showing that it is a method of construction not only durable, but also esthetically satisfying. to short, it will illustrate Mackie's feeling that the word "cabin", with its connotations of inferiority, should not be applied to a properly constructed log house.



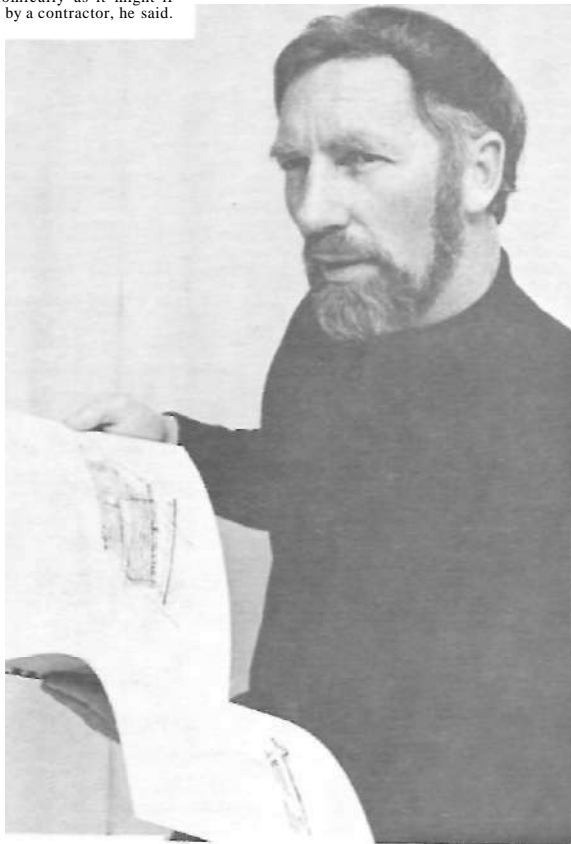
The Prince George book that has become a Canadian best seller

BUILDING WITH LOGS
by B. Allan Mackie
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(In softcover: \$8) 7.50

Step-by-step instruction, fully illustrated, showing how to build one of the most durable and beautiful forms of residential construction . . . the log house.

In the introduction to his popular book, "Building With Logs", he writes: "The axeman in the twentieth century, displaying this determination to find peace and sanity, is joined in history to every pioneer who set himself to carving a homestead in a new world." Axemanship, determination, peace and sanity, history, homestead, new world: that is what concerns Allan Mackie, and that is what his job as a builder of solid log homes means to him. Further on, he writes, "A log building ties time-honored tradition into our uncertain

tradition into our uncertain today, giving a sense of continuity and stability that is unusual in modern housing." It is the "only contemporary construction method which enables an individual to exchange his own labor and ingenuity, rather than cash or a mortgage commitment, for a home to be proud of." Strange words in this age of prefabs and mobile homes, when entire suburban developments have even been known to be condemned several short years after they were dumped on a section of raped landscape.



"logs bring the natural world back into our lives in a way that is becoming more necessary than ever to our survival as thoughtful human beings."
—B. Allan Mackie, Building With Logs 1972



GRADUATES OF A COLLEGE of New Caledonia short course in the construction of log buildings pose proudly atop the fruit of their three-week learning experience. The course is taught by Allen Mackie,

not pictured, and will be offered again in the fall. Enrolment can be arranged through Canada Manpower in Prince George. —Photo by Fred Fuchs



Mackie pauses to list the various wood preservatives effective for log homes.

A way of life

By Bill Lawson

For members of the community as well as the participants, the benefits of a short course in building with logs sponsored recently by the Adult Education Branch, were two-fold and long-ranging as well as a little unusual.

Beginning with the morning frost and working through the day for two weekends, a dozen or more local handymen wielded axes and saws and measuring instruments under the practiced eye of instructor Allan Mackie until, by the time the sessions were over, a small log house stood defiantly beside Chandler Park School, well on its way to completion.

The course was a condensed version of similar courses which Mr. Mackie conducts at New Caledonia College in Prince George, and which are aimed at potential professional builders who want to specialize in solid log construction, as well as individuals who would like to build their own log home, and others who are just interested.

It is not surprising that the number of applicants for such a unique course always greatly exceeds the size of the final group selected to participate in it.

For Allan Mackie, solid log construction symbolizes more than just a way of life. He is convinced that, in a heavily wooded area like B.C., it could and should be, one of the principle bases of society as a whole.

Log homes are simple en-

ough to build as to be within the reach of the average unskilled individual who is willing to devote the time.

Consequently, they can be built very cheaply, require a minimum of maintenance, and ... they last for centuries.

Therefore, when you talk about log houses, you are talking history and tradition, you are talking aesthetics and conservation, and you are talking versatility and self-sufficiency. In short, given half a chance, log buildings really could become a way of life.

Up until now, the classes at New Caledonia have been short and basic.

What Mackie would really like to see would be an intensive course which does justice to every aspect of house construction. Such a course would have to be at least six full months long and naturally would be aimed at training capable foremen who could eventually increase sufficiently in number to begin to meet the widespread demand for solid log housing.

In the meantime, it would seem unfortunate that persons interested in log construction in a less professional sense would be temporarily deprived of the opportunity to learn the art for themselves.

However, in the long run, this group would benefit by the increased number of builders qualified by training and, before long, experience, to act as instructors in the capacity which Mackie himself now fills.



Instructor Allan Mackie gives final instructions to some of the students with whom he worked during two weekends in Smithers to build this small log house.

So, it was both a privilege and a responsibility for the local men who worked and learned under Allan Mackie during the two weekends he was here to instruct, and he said that they acquitted themselves well.

He said it was a pleasure to work with men who already grasped the fundamentals of axemanship and who learned so readily. A little more practice, he felt, and they would have produced as tight a building as you could hope

to make. Now the community will have not only the benefits of their practical knowledge, but also the use of the building which they worked on, because it is intended for use as a changing room for the various sports teams which make use of the playing field adjacent to Chandler Park School.

The course was sponsored by the Adult Education Department in Smithers, and when completed by Jack Manton's industrial arts class at the

Senior Secondary School, the 15' x 20' structure will be donated to the Joint Grounds Development Committee for this purpose.

Thanks by the departments concerned have gone out to Mr. Mackie, to the men who performed the initial heavy construction, to Pacific Inland Resources who supplied the logs, and to Evelyn Mills who hauled them to the site.

The community can also feel reassurance in knowing that a number of its memb-

ers have taken the initiative to increase their versatility as craftsmen so that not only have new color and meaning been added to their lives, but also they will be just that much more employable and self-sufficient in the face of life in the north where such qualities can mean the difference between bare economic survival and a good life.

:2a, The WhitehorseStar. Monday, July 16,1973



Allan Mackie says logs are a solution to the housing problem

Left, A GREAT ADVOCATE of building with logs, Allan Mackie answered many questions pertaining to insulation, technique, construction, and the finer points of building with logs.

Right CUTTING ALONG the scribe marks that will insure a tight fit between the joining logs is Allan Mackie. He showed how to properly scribe with fixed points along the upper joining surfaces of the log with the one rolled upside down above it. The educational demonstration was well attended.

—Star photos



The Log Man May be Back to Teach

Mr. Mackie gave a slide show and chalk talk at the library Thursday evening and then took about 45 interested Yukoners out behind the building for an hour long demonstration with actual logs. Forestry personnel, members of the territorial government and Yukoners from Riverdale and the bush were in attendance. Some transients also interested in log construction came.

Mr. Mackie said that in some places in British Columbia log

buildings were desired over the regular frame style houses. He said there were three main reasons why he advocated log homes. First there is aesthetics. He said the "acoustic quality of the log walls as well as the pleasing sight of restful brown tones add to the snug security of fortress thick walls".

He said the Yukon has an abundance of trees suitable for building and gave durability as the second reason for log construction.

Logs have aesthetics, abundance and avoid mortgages

He gives his third reason for log construction as "the only contemporary construction method which enables an individual to exchange his own labour and ingenuity, rather than cash or a mortgage debt, for a home to be proud of."

He said it required hard work to build a log house but the rewards are well worth it.

In the slide show Mr. Mackie dispelled the "log cabin" idea with shots of many large, well

made, houses and in some cases mansions. He said log buildings are part of Canadian Heritage and are part of contemporary thinking.

His axe skill and chain saw expertise awed many would be log house builders who attended his short exhibition.

He is the author of Building With Logs and presently teaches at the College of New Caledonia, 2001 Central Avenue, Prince George, B.C.