

CORDILLERA ARCHITECTURE OF NORTHERN LUZON

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The Filipino house is much the same among civilized and uncivilized tribes, and has changed but little since the islands were first visited by Europeans. . . . There is nothing very distinctive about the Filipino house. Its general type occurs through the forested tropical parts of the earth, at any rate wherever the population does not live clustered in cities. The main requisite is a steep roof to provide a dense shade from the sun and shed the torrential rains. . . . The second requisite is a floor that shall be raised above the dampness of the ground and the snakes and vermin that infest its surface. The Filipino floor is always a few feet above the soil, often eight or ten, and sometimes, when houses are set in the forked branches of trees, twenty, forty, or even sixty feet. . . . The Bontok, Kankanai, and Nabaloi are the chief non-Negrito peoples in the Philippines to build directly on the ground.¹

Such sweeping statements must come as a surprise to natives of the Cordillera Central in Northern Luzon studying themselves from the American Museum handbook, for an eye accustomed to recognizing potential enemies quickly finds the differences between the architecture of one group and that of another obvious and immediate. Indeed, to even a casual traveler in the Mountain Province, each area appears to have its own distinct type of house, from the complex timber structures of the Apayao rain forests to the roof-heavy pine cubicles perched among the Ifugao terraces like gigantic mushrooms on four legs, from the shoot-shiney darkness of Bontoc interiors to the split-bamboo floors of Kalinga that can be rolled up and carried down to the river to wash. Moreover, to erect or move into a house of modern extra-Montane design is nowadays one of the most significant social changes a mountaineer can make, and the advantages in comfort and prestige of the new style are so great as to cause the old styles

1. Kroeber, A. L. *Peoples of the Philippines*, American Museum of Natural History Handbook Series No. 8, 1943, pp. 98-100.

almost to have disappeared from many areas.

In the Apayao municipal centers of Kabugao and Ripang (Conner) in 1956, and even as far into the interior as Namultugan, it was possible to find only two or three examples of classic Isneg architecture extant, and not one house of traditional Kalinga design still stands on the banks of the Saltan River from Limos to Pinokpok. That type of lowland timber and bamboo house which is pictured in Cole's 1922 *The Tinguians* as the indigenous Abra dwelling can be found today among Kalinga well-to-do in even quite remote areas, constructed with native tools by local techniques. In the southern half of the Province, a more American-style frame house of clapboards or galvanized iron is in vogue, and a barrio without at least one store built in this manner hardly exists; the G.I. roofs in the Bontoc village of Samoki outnumber grass roofs four to one. In communities on the junctions of the different ethnic groups, adaptation of a more spontaneous kind has produced a variety of hybrid native patterns; in Bitwagan, Sagada and Lepanto there are houses built of purely local materials by traditional techniques but rendered unorthodox by variations in size, shape or number of component parts, usually to the increase of convenience and often with real ingenuity. Only Ifugao stands aloof from this general trend, and a noteworthy aloofness it is, too, with one almost identical form of traditional architecture extending over a larger area than that covered by any other single Montane type, and with the modern lowland-style houses occurring only in fairly urban centers.

The extra-Montane house is immediately recognizable among Mountain Province types not merely by being more spacious but by an annex or separate kitchen where cooking is done, making the main room or rooms cleaner and colder, the latter disadvantage being overcome among the acculturated by the addition of layers of clothing. Native houses are basically one-room windowless structures dominated by high heavy roofs which leave a minimum of wall surface exposed to the elements. But the major structural difference is not so readily visible—and that is, that the roof and floor of Cordillera houses are never supported by the same posts. Among the southern tribes the roof rests on top of the walls of the house which is basically a box supported by posts which reach no higher than the floor joists, while in the north the roof and floor are supported by separate sets of uprights so independent of one another that the floor and all its underpinning can be removed and leave the roof still standing,

or vice versa. This latter consideration is so significant that it is possible to describe the eight or more distinct types of house in the Mountain Province in terms of two major lines of architectural technique. For the purpose of the present paper, these two schools will be called the Southern Strains (including Ifugao, Bontoc and Benguet) and the Northern Strain (Apayao and northern Kalinga), with highland Kalinga proper presenting interesting combinations.

The Ifugao house (Fig. 2) is compact, sophisticated in its deceptive simplicity, and may well serve as the prototype of the Southern Strain. Square in floor plan, it is elevated to about shoulder height by four posts (*tukud*), around which are fitted cylindrical wooden rat-guards (*halipan*), carrying two transverse girders (*kuling*) which support three floor joists into which the floor-boards (*dotal*) are fitted and wallboards (*gaob* and *pama-dingan*) and studs (*bagad*) are mortised. It is typical of the exactness of Ifugao construction that the three floor joists are designated by different terms indicative of their purpose—the center one is the *gawaan*, “center”, and the outer two are *mundilig*, a verb meaning the patting motion made with opposed hands to pack something together. The four studs, placed at the corners of the house, are mortised at their upper end into four tie-beams or purlins (*wanan*) which form a square to carry much of the weight of the roof as well as a central cross-beam (*pumpi-tolan*) on which stand two queenposts (*taknang*). These queenposts terminate in a small square (*ambubulan*) which supports the upper ends of the rafters (*bughol*), the roof being a true pyramid in form with four triangular sides and thus rising to an apex without any ridgepole. The wall-boards are rabbeted into a transverse beam (*huklub*) at waist- or chest-height, at which point a shelf (*patie*) is fitted between them and the roof, whose eaves descend as low as the level of the floor. Above the tie-beams a reed floor or platform is often fitted to make an attic-like storage space (*palan*) for unthreshed rice. Wooden panels close doorways on two opposite sides of the house, and entrance is gained by means of a ladder which is removed at night.

This type of house is called *bale* (or *fale*), but the same basic building with a few modifications—the wall-boards extend up to the roof, there is only one door, and the whole thing is smaller—serves as a rat-proof granary (*alang*). The pitch of the roof is the only noteworthy variation from one locality to another, those of Mayaoyao being steepest and those of Kiangan being most

shallow. With the exception of the reed and grass roofing, the whole house is made of heavy hand-hewn timber, preferably hardwood, especially the four posts, and can be expected to last a considerable period of time; with periodic reroofing, some houses in use today have been occupied for five or six generations. The houses of the wealthy in Mayaoyao are made of narra, a hardwood esteemed in the modern Mountain Province for cabinet-making, and polished to a glossy sheen with a rough hairy leaf called *appas* which is irritating to the naked skin. The whole construction is accomplished by clever mortising without nails or hardware, and the complete house can be knocked down, moved, and raised again on a new site within a single day. Poorer Ifugaos, and even the swidden-farming Kadasans of the Benguet-bordering western mountains, make a similar house with split-and-woven bamboo walls.

The Ifugao house is not without its disadvantages, however, and one of these is the often eye-smarting smokiness which results from cooking in a fireplace with no chimney, for a roof thatched tightly enough to keep out the rain but loosely enough to let smoke escape is an impossible compromise. The grass tied to the very apex of the roof is intended to accomplish this purpose, and in some places an old pot is turned upside-down over the loose thatch at that point. Another obvious disadvantage is the limitation in size attendant upon the traditional architecture, for although a wealthy man may build several houses, his family will live in the same restricted space in each of them. The actual floor space, where cooking and sleeping occur, is of little concern, for in the Mountain Province generally parents do not share the same bedchamber as members of the next generation beyond the age of earliest innocence, but the storage space above and the working space below are inconveniently cramped. These disadvantages have to some extent been alleviated in the houses of Bontoc and Lepanto.

The Bauko house (v. Fig. 7), in what is variously described as the Northern Kankanay or Lepanto culture area, employs the same basic design as the Ifugao house, although on a generally enlarged scale, and has a steep roof carried to such height that the less significant attic granary of the Ifugao house becomes almost an additional floor which can even be equipped with a fireplace for performing sacrifices appropriate to harvest and the storage of grain. Even more significant is the addition of a small ridgepole which renders the two roof surfaces parallel

to it trapezoids instead of triangles and so no longer sides of a true pyramid, and enables the cross-thatching to be carried out over two holes for the more ready exit of that smoke which rises up through the house to prevent the rotting of the damp roofing and the mildewing of stored foodstuffs and utensils. The lower edge of this roof is flared outward by short auxiliary rafters to wide overhanging eaves which greatly extend the protected working area under the house. Instead of the rolled reed mats which are sometimes put down for domestic chores on the stone paving under Ifugao houses, in Bauko long planks are laid down to form a partial floor, as well as various heavy wooden bench-shaped furniture and semi-compartments which make the whole house virtually a three-story affair.

This move to the ground floor is completed in the Bontoc house (v. Fig. 7), where the roof is so extended both downward and outward as to require more support and stability than is provided by the central four-legged structure, so its outer edges are lashed to eight auxiliary posts set in the ground. Between these outer posts is run a continuous waist-high wooden wall, with a door on one side, clearly defining the ground-level living space where eating and sleeping as well as working take place, the elevated wooden chamber and attic above being relegated to the status of granaries. Since the floor of this granary—with the usual three joists on two girders—is only about four feet above the eathern floor of the house proper, headroom for such tasks as rice-pounding is sought under the roof off to one side and increased by digging a shallow pit for the mortar, chaff, and person threshing. To both left and right the dirt floor gives way to plank storage and working spaces, the fireplace, and a bed-chamber in a tight wooden box into which the parents retire after building a fire in it, the spaciousness of the Bontoc house having been bought at the price of such chill dampness as blows freely in and out between the low-hanging eaves and low outer walls. Even this inconvenience is removed in the Sagada house, 2,000 feet higher than Bontoc on the western shoulder of the Cordillera, where the architectural trend is carried to its logical conclusion by closing in the ground floor completely with a tight wooden wall.

The fact that the "second story" in Bontoc is literally a granary is accentuated in the Sagada style of house known as *innagamang* (literally, "granary-style") (Fig. 3). The central granary (*agamang*) stands on the four posts (*tokod*) carrying

two girders (*kiling*) and three floor joists (*desa*) characteristic of the Southern Strain, but, inasmuch as the whole house is now in contact with the ground at so many points that ratguards on the posts would be useless, the granary is made truly rat-proof by replacing the reed ceiling which would form a third-story attic with a gabled roof of solid planks mortised and rabbeted together (*ka-ogkog*, *ta-eb*, etc.). This whole structure is known as the "heart" (*poso*) of the house, and on it stand two kingposts (*dawis*) which support the short ridgepole (*pamobbongan*) which receives the upper ends of the rafters (*bogso*). Short light posts under the eaves carry the lower ends of the rafters, and to these posts horizontal planks are lashed (*dingding* or *diding*) and chinked with mud to enable the house to be comfortably heated by the cooking fire. The rice-pounding space is most typically at the back of the house opposite the door, with the fireplace on the opposite side from the plank platform which serves as the parents' bed (although some older people prefer to sleep in the second-story granary in cold weather). Typical of the Sagada house, too, is an adjoining stone-lined pig-pen excavated outside the door, with a bedroom for this important domestic animal extending for warmth under the house itself.

Much of the Sub-Province of Benguet occupies cold mountain-tops where life is difficult, irrigated rice has only recently been introduced, and a majority of people still subsist on root crops. Poverty on the one hand and the ability of the well-to-do to respond to Spanish and American acculturative influences on the other have combined with the migrations of at least two major dialect stocks to prevent so distinct an architectural picture as can be discerned in other parts of the Province. Many swidden-farmers and gardeners live in hut-like dwellings with such atypical features as girders and floor joists hung from the roof-supporting posts, or an indeterminate number of logs and joists dependent upon the slenderness of the materials available. But in such western Kankanay settlements as Kibungan and Bakun, descent within the common Southern Strain is indicated by the facts that many houses standing on eight or ten short posts prove to have four sturdier ones in the center, and their three floor joists are crudely whittled out in imitation of the subtle tapering of the equivalent beams in the Ifugao house.

There are still enough of the older Benguet houses in use, however, to demonstrate the local development of the southern school of architecture among the Kankanay and Nabaloi. The

Bokod house (Fig. 4) solves the problem of restricted space by a simple direct method—the elevated chamber is itself enlarged, requiring consequently longer and sturdier timbers for its sub-structure. The four posts (*tokod*) which carry the two girders (*ballangan*) with their three joists (*sagpad*) are sometimes added to in very large houses, a center post being put under the center joist, or posts being added to the center of each girder, bringing the total to seven or even nine. Similarly, another girder, with required posts, may be added, although no such example was observed. The floor-boards (*sha'tal*) are carried directly on the joists, as are the four sills (*opop*) mortised into them which receive the wall-boards (*dingding*) in rabbeted grooves. About waist-high the walls are strengthened by a kind of moulding (*balkes*) running around the four sides, and the upper ends of the wall-boards are fitted into beams called *goanan* (the equivalent of the Ifugao *wanan*). Small tiebeams or cross-beams (*anayasan*) run from side to side from front to back, resting on these *goanan*, and carrying two kingposts (*kalasod*) which support the ridgepole (*bobongan*). The ridgepole is longer and the rafters (*dagat*) shorter in the Bokod house than in most Mountain Province houses, so the exposed walls are given protection by a wide-flaring set of eaves (*sibey*) requiring their own rafters (*tikel*) with supporting braces (*sedngal* or *tedmek*), three on a side. The proportions of the Bokod house make it possible to walk upright under the eaves, which is possible in only some of the Ifugao houses and none of the Bontoc houses. Moreover, the square floor plan characteristic of the Southern Strain is sometimes extended into a rectangle by the addition of posts or another girder or floor joist.

The characteristics of the Northern Strain can be seen at their most sophisticated in the ingenious Isneg house (Fig. 5) with its rafters bowed into the shape of a Gothic arch, its floor and roof supported on completely independent series of posts, and the floor itself having slightly raised platforms along both sides. The Isneg floor plan, in contrast to the square houses higher on the Cordillera, is conceived in an elongated form, the underpinning vaguely suggesting marine architecture to the layman, with girders sometimes exceeding 24 feet, thus doubling the longest timbers of the buildings of the Southern Strain. Each of these two long girders (*anadixiyan*) is mortised into the top of three posts (*sinit*) which elevate the floor to about the height of a man's shoulder, and across these girders are eleven floor

joists (*toldog*). The actual flooring (*datag* or *xassaran*), however, is a mat of bamboo grass or rattan, and it rests on a series of thin laths (*talaxatag*) mortised into the upper surface of the joists, parallel, therefore, to the girders beneath. Also riding on the joists are two longitudinal beams or stringers (*tapi*) whose top surface is about three inches higher than the flooring and into which are mortised, at the same level, four longer crossbeams (*agnadan*)—two at one end of the house and two at the other—which protrude a foot or more beyond the ends of the joists. Mortised into the outer ends of these crossbeams are their horizontal equivalent, sills into which the base of the wall-boards (*dingding*) are rabbeted; and between these sills and the parallel stringers short laths are also mortised to support a sort of flooring platform or seat about a foot wide along both sides of the house.

A remarkable feature of the Isneg house is the way in which the roof is supported on posts which are set in the ground *outside* the floor-supporting posts but *inside* the wooden walls of the house, passing up through the little side platforms. These six posts (*adixi*) carry two longitudinal beams (*ampakan*), while three crossbeams (*sakkar*) are mortised into either the posts themselves or the *ampakan*-beams. Fitted into the outer ends of these crossbeams are longitudinal beams serving both as a base for the rafters (*tadawag* and *baday*) and as the upper track for the wall-boards, the appropriate groove being deep enough to allow the boards themselves to be lifted up and slipped out of the lower groove so that the house can be converted into a kind of open covered platform. From the crossbeams also rise a kingpost (*patuna* or *pantud*) and two queenposts (*pantud*), across which are three tiebeams (*sokar*) terminating in three purlins (*irat*) on each inner face of roof, which is a base of reeds (*rarat*) to which the grass roofing (*atap*) is lashed. The rafters themselves, alternately wood and reed, are bowed into a graceful arc, and rise to a ridgepole (*talabawan*) which protrudes beyond the ends of the house to protect the smoke holes in the gables.

The Isneg house not being square in plan, its opposite ends are quite different from one another. At one end, just outside but a bit higher than the transverse beam into which the upper ends of the wall-boards are rabbeted, is another transverse beam whose upper edge is grooved to receive a second tier of wall boards which close the upper section of the gable save for a few feet at the top which are left open as a smoke hole or only loosely covered with horizontal bamboo. The other end of the house

terminates in a kind of transverse platform or annex with a lean-to roof up against the gable itself; at the outer two corners of this little annex, in line with the full width of the building, are two more *sinit*-posts under the wall itself, a circumstance which has led some observers to report with slightly dramatic exaggeration that the floor, walls and roof of the Isneg house are supported on three separate sets of posts. The floor of this annex is slightly higher than even the little side platforms of the house proper, and Cole reported fifty years ago that it was a special sleeping area for men;² H. Otley Beyer recalls that women were not even allowed to set foot there.³ In the long sides of the house three or four windows are produced simply by omitting some of the wall-boards; since the door opens into one of these sides, however, it might be more appropriate to refer to it as the "front" rather than "side". Entrance is gained by means of a permanent short flight of steps or ladder.

In the Mabaca Valley which flows along the northern edge of Kalinga Sub-Province on the Apayao border and into the lower Saltan River just before that stream joins the Chico River at Pinokpok, are other houses of the "pure Northern Strain,"—that is, elongated and gabled. They do not duplicate, however, the complexity of the Isneg roofposts interwoven, as it were, between the walls and floor joists, and they have front doors entering the end of the house opposite to the annex or lean-to which here is a distinct room serving the purpose of kitchen rather than a kind of open platform. A photograph of a Pinokpok house taken a half-century ago⁴ shows the sills carrying the wall-boards to be mortised into the roof-supporting posts, three on a side, with two more posts in between these three rising to the roof inside the wooden walls. In upper Mabaca and Buaya, these "extra" posts which have not been merged with the wall structure do not appear, the houses being shorter and the weight of the roof being distributed by enlarged purlins the size of the ridgepole itself, one on each side. These sturdy purlins form

2. Cole, Fay-Cooper, "Distribution of the Non-Christian Tribes of Northwest Luzon," *American Anthropologist*, new series, Vol. XI, No. 3 (July-September 1909), p. 347.

3. Personal statement during interview in Manila on Feb. 19, 1962.

4. The author is indebted to Dr. H. Otley Beyer for making this and other photographs available.

the fulcrum across which the rafters are bent, giving the roof on close inspection the shape of two shallow arcs rather than the continuous graceful curve of the Apayao roof. The pressure thus brought to bear on the purlins requires them to be carried at both ends on posts just as sturdy as the other roof-supporting posts, standing just outside the walls of the house at front and back. In Conner district of Apayao, similar houses have these purlin-supporting posts worked into the gabled wall as an integral part by mortising.

The need for this emphasis on roof support can be readily understood in those Mabaca houses with thick bamboo roofs of eighteen-inch half-sections laid on like shingles to a depth of eight or more layers to form a truly weighty covering which is reported to last 20 or 30 years. A simpler sort of bamboo roof is made by sections so long that only two are required to reach the whole distance from ridgepole to eaves. Bamboo is also used as a regular building material in this same area, a good solid walling being produced by lashing horizontally half-cylindrical sections alternately facing inward and outward, so that the edges of one section lock into the center of the next above and below. Common to this area, too, as to all of Kalinga and the lower fringes of the Province where bamboo and rattan are plentiful, is the split-and-woven walling called *sawali*, for which stems of bamboo are split down one side and then hammered flat into a strip about eight or ten inches wide which can be plaited together to give a very resistant and resilient mat-like wall section. In the little Asiga village of Bontok (not to be confused with the provincial capital in the sub-province of the same name) half-section bamboo covering is applied to a framework of wooden poles, no hewn or squared beams being used at all, and 30-year-old photographs⁵ indicate that this type of house was formerly common to the southeastern corner of Apayao Sub-Province.

The various house styles of the lower Saltan and upper Mabaca valleys do not always include the curved roof with bowed rafters, but a gabled front with two tiers of vertical wall-boards and an upper triangular space loosely covered with bamboo lathing is an invariable characteristic of this architectural family. So, too, is the distinctive floor—supported by a row

5. The author is indebted to the late Dr. Felix M. Keesing for making these photographs available.

of posts set inside and independent of the roof-supporting posts, divided longitudinally into three sections, a lower one in the middle and raised sections along both sides, most frequently covered by rolled matting of split rattan or reeds laid loosely on laths mortised into the floor joists and able to be rolled back conveniently to permit betelnut juice to be spit through onto the ground below. The more complex houses are also characterized in Mabaca-Buaya by having the roof protrude much farther beyond the ends of the house at the ridgepole than at the eaves, giving the building a sort of ship's-prow profile reminiscent of Indonesian architecture. A straight-roofed variety of this same basic house pattern occurs as the native style in Salegseg across the mountain to the south in the upper Saltan valley, where it forms a nice contrast with the typical Kalinga houses of the Banaao district upstream and Limos downstream.

Although these northern houses are often square in floor plan—sometimes reaching 25 feet on a side—, their basic “fore-and aft” construction is emphasized by the addition of annexes, lean-tos, porches and various covered working areas on the front and back, two such houses sometimes even facing each other under such a roofing. The desirability of separating the smoke of the cooking fire from the rest of the house has led to two developments in Mabaca, one in which the kitchen-annex duplicates in cross section the house walls and roof on a smaller scale, has its own complete underpinning, and is entered from the house proper through a low doorway, and the other having the kitchen as a part of the main structure but separated from it by a three-quarter-height wall, the annex itself being a mere pantry too small to enter. So frequent and so varied are these porches and lean-tos that Keesing in the 1930's considered them crutches for sagging elderly buildings,⁶ Isneg houses especially sharing the pan-Philippine want of structural triangles that results in a tendency to topple sideways and requires the eventual addition of diagonal poles outside the house to shore it up.

The literature on the Mountain Province has been much impressed with the variations in material culture among the peoples inhabiting the Sub-Province of Kalinga, and a cor-

6. Keesing, Felix M., “The Isneg People of the Northern Philippines,” unpublished MS, copy furnished by the author in 1960.

respond plurality of architectural types is therefore also to be expected. Along the far-eastern limits of the sub-province tree houses have been reported as a kind of Kalinga dwelling, but such as still stand seem to be dismissed by modern Kalingas as the habitations of the benighted Gaddangs and so have not been considered significant to the present study. The similarity of the Salegseg house to the Northern Strain in the Mabaca-Buaya region has already been remarked, and what appears to be a peculiar local development in nearby Balbalan and Tanglag will be commented upon later. But for these exceptions, the following features can be pointed out as characteristic of the Kalinga house—the floor has a threefold longitudinal division with the two side sections three or four inches higher than the center, and is raised off the ground to chest height by posts independent of the roof and walls, and there are three openings: two at floor level opposite one another and one at ground level opening into an unfloored area usually containing a mortar and pestle. These features are found in typical Kalinga houses both of wood and of bamboo—although, needless to say, very small houses do not incorporate them all. Another almost inevitable characteristic is the piling up of logs and lumber along the outside of the house as if to prevent any enemy from slipping underneath to drive a sudden spear up through the bamboo flooring. (V. Figs. 8, 9)

Well-known to every traveler down the Chico River is the octagonal Kalinga house (Fig. 6), which formerly could be found from one end of the sub-province to the other. They stood in Bugnay on the Bontoc border as late as 1957 (when the whole village was destroyed by fire and largely rebuilt), and can still be seen as far downstream as Banat to the east of Naneng. They are not now common northwest of Lubuagan, but in 1885 they were noted in the Guinaang (Lubuagan) region of the upper Pacil valley by a German scientist.⁷ In Bangad, which is fairly central to the area being considered, the three floor joists, two girders and four posts which form the foundation of the house called *fat-ang*, *'oling* and *tu-od* respectively, and riding on top of the joists are two beams or stringers that run from front to

7. Schadenberg, Alex., in *Transactions of the Berlin Anthropological Society*, Session of 19 February 1887; translation by Alan L. McPherron supplied through the courtesy of the Department of Anthropology, University of Chicago.

back called *anisil* or *fuchis*. Just beyond each end of these stringers, but not mortised into them, is another post set in the ground, and at equivalent distance from the center of the house four more off to each side of the central four, giving a total of eight for the support of the wall. Across the tops of these eight outer (and lighter) posts, and connecting them, are eight short sills (*pisipis*) grooved to receive the wallboards (*okong*), the front and back ones being parallel, the two side ones being parallel, and the four corner ones joining them at a 45° angle—producing that eight-sided plan for which the house is famous. The logs piled outside below the level of the floor are backed up against a *sawali* matting (*dingding*) which encloses the area beneath the house.

The reed-mat floor (*tatagon*) is laid down in the center section on laths (*chosar*) set into the top of the three joists parallel to the stringers, and in the two side sections on laths which run transversely from the outer edges of the stringers to the inner edges of the sills. Mortised into the upper faces of the stringers are four sturdy posts (*paratok*), each two of which carry a cross-beam (*fatangan*) which, in turn, carries two light queenposts (*ta'ray*) supporting four crossbeams or purlins (*ati-atig*) in the form of a square. The rafters (*pongo*), fastened below to the upper *pisipis*-beam of the outside wall, are bowed over these purlins and drawn together over three small ridgepoles which carry little actual weight but form the ridging (*panabfongan*). Despite the central square foundations and the octagonal floor plan, however, the roof with its ridgepole presents a different profile from the side than from the front. The bowed *pongo*-rafters are not duplicated on the front or back of the house; instead, straight rafters (*pakantod*) run up only as far as the *ati-atig*-crossbeams, except for the central one which continues on up to give some stability to the ridgepole formation. The thickness of the grass thatching and the extent of the smoke hole overhang, however, disguise these details from the observer on the outside, the whole roof appearing as rounded as would be appropriate to an octagonal building.

The front, back, and two sides of the octagonal Kalinga house are a bit longer than the diagonal corners, and the sills on the front and back which support the openings which serve as both doorway and window actually have a different name (*pang-saway*) from the others (*pisipis*), and are supported by being mortised into the stringers. The floor area, moreover, never pre-

sents a truly octagonal space, for one corner is always missing where the ground-level door enters into the rice-pounding area to be considered the true entranceway, a short ladder often being provided therein up to the floor level. To support the resulting exposed edge of lathing and flooring, as well as to provide additional support for areas like the fireplace ashpit, extensions are mortised into the end of one or more of the joists and carried to the outer posts. The eightsidedness of the house, therefore, is structurally more apparent than significant; what has happened is that the central square of the house has been extended on its four sides and the resulting four triangular areas included within the walls of the house but not always floored over.

The octagonal house a generation ago was considered the dwelling of the rich, and square houses less aristocratic, although this attitude has disappeared as the wealthy have more come to build non-Kalinga-type modern houses.⁸ These square houses might on statistical grounds alone be called the "typical" Kalinga house, such dwellings with *sawali* walls appearing to the upper reaches of the Saltan, Pacil and Tanudan valleys, and being the only type encountered in the swiddens between Tabuk and Natonin except for those even flimsier huts in the Bacari-Kalakad Gaddang areas which are considered by other Kalingas "hardly houses at all" and which are frequently destroyed by fire when their builders move on to new swidden sites.⁹ These *sawali* walls are lashed to the outside of the roof-supporting posts (frequently made of the fern-tree trunk which is resistant to rot), and the floor is so independent of them that an opening of several inches appears between them on all sides through which betelnut juice can be spit. In the Chico valley, such square houses are often made of wood, and by the time the pan-Kalinga logs are piled up around the outside and the grass roofing laid on like a farmer's old straw hat, it is difficult to distinguish them from octagonal houses at a distance. In these wooden houses, of course, the wall-boards are mortised into sills, not lashed to the outside posts, and in more modern versions the four corner posts are likely to

8. The author has been unable to discover any house with the separate reed ceiling described by R. F. Barton in *The Kalingas: Their Institutions and Custom Law*, Chicago 1949, p. 11, fig. 2.

9. The octagonal house has not been observed in areas where irrigated rice is unknown.

carry the roof in extra-Montane style with the floor joists and sills mortised in.

The Kalinga combination of the three-division floor of the Northern Strain and the square three-on-two-on-four underpinning of the Southern Strain always presents an engineering problem, but in the type of house with absolutely independent mat walling, even more so—for how are the laths beyond the central-square timbers to be supported at their outer ends? One solution is to have all the lath-supporting beams mortised together into a framework all on one level, carrying the laths on their upper surfaces or in holes augured near the bottom edges as necessary, this framework then standing solidly on a central four-post foundation but having auxiliary posts at its outer edges. The presence of such underpinning cannot be detected in most houses without a certain amount of crawling about on hands and knees, but it exists from the Bontoc- and Ifugao-bordering heights of the Cordillera at least as far as the Pacil River communities northwest of Lubuagan where a local custom of making these posts or their sockets of stone combined with a disastrous fire in Dantalan in 1956 to make a dramatic display of the fact; the sites of the 63 houses razed displayed a single pattern preserved in stone—four central posts with a varying number around the edges. This potentially awkward wedding of the two different floor-and-foundation trends shows up graphically in the type of house peculiar to Tanglag and Balbalan, in which the house is elongated even to including the “front porch” under its roof and the three-section floor is not even broken for the pan-Kalinga ground-level entrance; yet, where one would expect the double row of posts, long girders and six floor joists of the nearby Salegseg house, the Ifugao underpinning shows up as if lost somewhere amidships.

Montane houses being, like all Filipino houses, structurally competent without their walls, it follows that the walls can be added out of a great variety of materials without affecting the strength of the building, and Kalinga's geographic variations present practically every building material known in the Mountain Province. Yet from the cool pine-clad heights of the Cordillera crest at Sumadel and Botbot to the bamboo groves and grassy foothills of Bonot and Pangol, it is the general rule that solid wooden houses are esteemed more highly than any other kind, not only because of their comfortable sturdiness but because of the long period during which they can be expected to

remain habitable with minimum repairs.¹⁰ For the same reason, in areas of plentiful bamboo, solid wooden beams are sought for the basic framework and foundations, with half-sections of bamboo ranking ahead of *sawali* matting for walls. In several areas bark is also used to cover small houses, as has been reported for Benguet and Apayao in the past. In most Kalinga dialects, two types of housing are distinguished—the larger and more sturdy, and the smaller and flimsier.

Roofs in the Mountain Province serve the auxiliary purpose of protecting the walls of the house from direct exposure to the weather and are therefore carried as low as possible. The Ifugao implementation of this secondary purpose is, as has been seen, dramatically straightforward, while in Bontoc and Chico Kalinga the tendency is to add wide-flaring eaves. In the far north, the roof has been carried down the sides of the house so far that headroom is obtained by bowing the rafters or, as in the case of Mabaca, bending them into an almost mansard-roof profile. This Northern Strain has the disadvantage, however, of leaving the two tall gables on either end of the house exposed, which is corrected in at least some Apayao houses by using a kind of leafy roofing material above the first tier of wall-boards. The roofing material, with the exception of the solid bamboo roofs already noted, is invariably a kind of coarse grass bound to a flat covering of parallel reeds; in a few places at lower altitude the leaves of these same reeds are used instead, and at a few places the roofs are mainly grass but have reed-leaves at the eave ends. The four-trapezoid roof common, in varying proportions, to the rest of the Cordillera has the double advantage of giving eaves and protection to all sides of the house at the point where rain is most likely to beat in, yet having what amounts to tiny open gables under the ridgepole as smokeholes. This is the general shape of the tile roofs of Japanese and Chinese temple architecture, and may well serve as a clue to the origin of the same.

Montane houses have no furniture as such, and other household fittings are very simple. Cooking is invariably done in a square ashbox fireplace with no chimney and with three stones

10. So enduring are some of these houses that a settlement pictured in a 1912 *National Geographic Magazine* (Vol. XXIII, No. 9, p. 868) was immediately recognizable during a visit to Canao, Kalinga, in 1956.

on which to place the pot, these stones often being carved into some rough shape with a dull bolo, e.g., an octagonal column in Bugnay or a cat in the lower Saltan valley. Above the fireplace there are always two or more shelves suspended from beams or crosspieces, a heavier one for drying firewood and lighter one for grain or legumes. Such food as salt which requires dry storage is kept in bamboo, wooden or woven containers tucked in someplace over the fire or in the roof structure, and a number of bars or protruding ends of beams, sometimes carved into hook shapes, serve for hanging clothes or other things likely to be chewed up by rats. Although both eating and sleeping are done on the floor, common in the southern part of the Province are blocks of wood about four inches high used as stools or pillows or as supports to raise the head end of a sleeping board, while in Kalinga people sleep with their heads resting on the higher side sections of the floor. In Kalinga, too, where hairloom Chinese plates are made much of, most houses are fitted with a kind of plate rack for preserving and displaying them. Mountain Province houses also have a ladder or short flight of stairs—which may be simply notched steps cut into the upper edge of a diagonally placed log—either from the ground to the floor or, as in the case of Bontoc, from the ground to the granary.

In addition to the classic houses described, there are two other kinds of structures erected on the Cordillera Central—granaries and huts. The Ifugao granary is a smaller version of the traditional Ifugao house, modified only in that the wall-boards are continued up to make a tight junction with the roof. The same general design has been rendered completely rat-proof throughout much of the rest of the Province by completing the roof with planks, as is to be found at the "heart" of the Sagada *innagamang*-style house (Fig. 3), although such solid wooden granaries still require a rain-shedding thatched roof besides. The Ifugao-style underpinning can be found as far away as Abra and Kalinga, but more common are granaries whose bodies are set directly on two joists rather than three, or even on the two girders themselves. Observers in Northern Luzon have been forcibly struck by a different type of granary among the Tinguian of Abra and Isneg of Apayao, a type whose *sawali* walls flare outwards in an arc of increasing intensity to present the graceful curve of their Indonesian counterparts, a surface difficult or impossible for rats to climb, and no small trouble in construction. (Fig. 10) The foundations of these northern granaries are

also different: the storehouse rests on four girders mortised across one another on the same level with their ends protruding beyond the joint, which joints stand directly on the foundation posts. It is not surprising to find such simple supports nowadays under an increasing number of northern granaries whose walls are made of solid mortised planks.

Under the general designation of "huts" we include field shelters and temporary campsites, the community dormitories of the Bontocs (*ato* for boys, *olog* for girls), and, somewhat unchivalrously perhaps, the houses of the poor. These structures are generally of somewhat makeshift character, but almost always have a ridgepole with a two-face roof (although rarely a simple sloping one-face "shed" roof). The walls of such huts are never wooden; they are most typically grass thatch, reeds or *sawali*, but sometimes bark. Three types of floor are utilized, depending upon the permanence of the building—a reed mat on the ground itself, an elevated bed-like platform independent of the rest of the structure, or a more permanent flooring riding on poles lashed to the uprights. Of a more distinctive and permanent character are the Bontoc sleeping houses, which are long squat buildings with low walls of crudely fitted stones and mud chinking, most of whose interior is occupied by a reed or plank platform where the inmates sleep body to body. Although the mens' dormitories often have an open porch at one end or are even themselves open, in higher altitudes such buildings are capable of having their tiny door tightly closed at night to conserve the warmth (and, unhappily, the smoke) of the fire which is kept burning inside.

The same general term for "house" is used in all Montane dialects except Bontoc, although the fact is somewhat disguised by differences in pronunciation. In the Mountain Province generally, the *b*-sound is pronounced differently at the beginning of a syllable from at the end, the syllable-initial position sounding like an *f* in Ifugao, Bontoc and Kalinga dialects or sub-dialects on the heights of the Cordillera, and as an unaspirated strongly labialized or palatalized *p* in eastern Ifugao and northern Kalinga; to this must be added the fact that *l* is in some places pronounced *r*, disappears completely in others, and in Kalinga sounds so much like *y* that it is difficult or impossible for non-Kalingas to recognize the difference. These sub-phonemic differences produce quite a colorful list of local variants—e.g., *bale* (Kiangan), *fale* (Banaue), *pwale* (Mayoyao), *baley* (Ba-

kod), *ba-ey* (Bakun), *bo-oy* (Kayan), *booy* (Asiga), *be-ey* (Tiempo), *boroy* (Bonot), *foruy* (Bangad), *buloy* (Mabaca), *fuloy* (Bugnay), *pfoloy* (Talalang), *bfuruy* (Maducayan), *fyarey* (Natonin) and *biloy* (Lubuagan). The same root word is found among neighboring dialects (e.g., Ilocano *balay*, Cagayan Negrito *bali'*, Ibanag *bale*) and pretty generally throughout the Philippines (e.g., Mandayan *baey*, Tagalog *bahay*)—to say nothing of far Polynesia (e.g., Hawaiian *hale*, Samoan *fali*). The Bontocs, however, call their houses *afong*.

Bawi is another pan-Montane word which certainly appears to be cognate with *bali*, yet in almost all dialects both words are present and the distinction between them consistent—*bali* is “house” and *bawi* is “hut”. More specifically, a *bawi* is a temporary or casual shelter like a campsite; in no dialect is it applied to buildings permanently occupied as dwellings. An element of permanence is incidentally lent some of the *bawi* in the Bontoc area because of the fact that such look-out or omen-seeking campsites on the ridges outside the town limits were prominent features of warfare in the old head-taking days, and trips to such sites have nowadays been fossilized into religious ceremonies which make the *bawi* somewhat shrinelike. Travelers who find themselves in between settlements at nightfall or in the face of threatening thunder-heads may build a grass *bawi*, and so might workers who have to stay all day in the hot sun in the fields. In Apayao the same term is applied to the simple roof erected over a blacksmith’s forge. But generally, huts which have even a small permanent role to play in the community life are not called *bawi*; in Kalinga and Apayao, for example, sheds or shelters in the fields from which children scare birds away from the crops are called *sigay*, and in Benguet *abulan*. The Nabaloi do not use the word *bawi* for a campsite hut as such, but have the term as a verbal stem which underscores its basic meaning—to stay away from the house overnight, e.g., “*Inanbawiday ka-ongko*—My pig didn’t show up for a couple days.”

The word *abong* is restricted to the southern part of the Province, where it generally has the meaning of a lesser or hut-like house. The Ifugaos apply the term even to field huts, but mainly to those simple dwellings or sleeping places not built in traditional *bale*-style. The *abong* is built not only directly on the ground but close to it, and never has walls of mortised boards; usually its ridgepole is one of its longest members because it is basically little more than a gabled roof. In Sagada the

term is applied specifically to those long low buildings which form the male dormitories of the *dap-ay*, as the political ward centers are called. (The Ifugao dormitory may occupy either a *bale-* or *abong-*style building.) The Bontocs, as we have seen, use this same term for houses in general, but *baley* is also well-known to them in the forms *faley*¹¹ or *finarey*, by which they designate those classic "three-story" houses which carry the Southern Strain in their granary-form hearts, and they evidently find these towering structures the characteristic of a community rather than *afong* in general for their word for village is *fabfey* or *fabrey*, equivalent to Ifugao *bable*, Bauko *babey* or Sagada *bab-a-ey*. Moreover, there is linguistic evidence that the Bontocs' southwestern Kankanay speaking neighbors were also once *abong*-dwellers—although the Kankanay word for house is *ba-ey*, in Sagada *omabong* means "to set up housekeeping, to dwell," while in Bauko *sinpangabong* is "a family, a household," and field huts are *ab-abong*, literally, "like an *abong*," i.e., an *abong* must be that which the field hut imitates, namely, a house.

Since the Bontocs use the word *abong* (*afong*) for houses in general, what do they call those truly *abong*-style structures which serve as the sleeping house in the *ato* ward centers? Jenks says that the two in each *ato* are called by different names though being of identical construction—one *bawi* and one *pabafunan*¹²—but nowadays the building is called by the same term as the whole physical institution, *ato*, and modern Bontocs ridicule the idea that *bawi* could be applied to so dignified and permanent a structure. *Pabafunan* (*pab-afonan*), however, is derived from another root, *obon*—a gathering, group—and calls attention to the major role of the *ato* in Bontoc society. Segregated sleeping quarters are not restricted to Bontoc culture—the Ifugaos have such dormitories—and mens' clubhouses where warriors gather and battle trophies are preserved are widespread throughout southeast Asian societies, but the use of this institution as a political unit in a quasi-urban community appears to be an indigenous Cordillera development.¹³ Only in the Sagada area is the building

11. Presumably what A. E. Jenks recorded in his 1905 *The Bontoc Igorot* as *fa-yü*.

12. *Op. cit.*, pp. 50-52.

13. See Eggan, Fred, "Some Social Institutions in the Mountain Province and their Significance for Historical and Comparative Studies," *Journal of East Asiatic Studies*, Vol. III No. 3 (April 1954), pp. 329-335, Manila.

itself distinguished; in Bauko both the premises and the building can be called *dap-ay* or *at-atoan*, while in Bakun far to the south, where the political ward system either never developed or has disappeared, there is a vague concept of *abong* as a men's sleeping or gathering place. The word *ato/ator* itself is applied in Ifugao (*atol*) to high stones suitable for lookout positions and in Benguet to stone walls, while in Lepanto-Bontoc literature *men-ato* is a poetic term for guarding a house; and the Northern Kankanay name for the *ato* is *dap-ay*, which in Bontoc central simply designates stone paving. All of these terms, like *obon* itself, emphasize the function of the gathering place rather than the structure, whether for sleeping or anything else.

Although in Ifugao the term *bale* is used both for houses in general and for the traditional specific type of house, in the other sub-provinces different styles of building are distinguished by different names. The smaller houses of Bontoc, for instance, are called *fnallawang*, and more hutlike dwellings *kolfong*, with the rather characterless modern houses with their shallow roofs called *pinang-ong*, literally, "tortoise-shape". The big "three-story" house is called *binna-ey*, *binang-iyen* or *binangi* in Sagada, smaller "one-story" houses *tinokbob*, and the *innagamang*-style with its complete wooden granary has already been described. In Bokod a poorer type of house with *sawali* walls, whose beams are unsquared poles, is called *dokbut* and is believed by natives to be an older style; the large wooden house is called *tinabda*, a term (i.e., *tinabla*, from Spanish *tabla*, board) which in the rest of the Province is applied to modern houses of extra-Montane style,—considerations which suggest a comparatively late introduction of the Southern Strain into the Agno Valley. Throughout most of Kalinga the less expensive houses are called *kulub*, which, except for the fact that they never have mortised wooden walls, present quite a variety. A mere six-foot-square shed with half its floor space elevated as a sort of platform may be called by this name, but so may the larger *sawali* houses of the swidden-farming eastern foothills in typical Kalinga style with ground-level entrance; in Manangol, houses whose long girders are supported on six posts and houses whose floor joists are cut into the posts that support the roof are both called *'olub*. The big octagonal houses are called by various names (e.g., *kinipas* in Tanglag, *ginitob* in Dakalan), but *binayon* or *finaryon* is understood through most of Chico Kalinga. It may be noteworthy that the Isneg call their big houses, which are certainly anything but

octagonal, *binuron*, and that while modern Kalinga informants distinguish their octagonal houses as being "round" or "eight-sided", older natives characterize them as "big and wooden". There is also a tendency in the common speech of eastern Kalinga and Conner district of Apayao to distinguish the big houses from the *kulub* as *balay*.

Comparison of the terminology of structural parts discloses only a few which are pan-Montane, and these happen also to be pan-Philippine. The cross-thatching which forms the ridging of the roof is called *bubong* (*bobon*) from Ifugao to Kabugao, and the ridgepole supporting it *bobongan*, *panabfongan*, *pamabbongan*, *tempfongan*, *tappongan*, etc., while the Tagalogs apply the word *bubong* to the roof itself. The grass roofing (Ifugao *atop*, Bokod *atep*, Bangad *otop*, Isneg *atap*) shows up in distant Mindanao as Agusan Mandayan *atep* and Tiruray *atef*, and can even be recognized in Tagabili [*kêtêf*]. So, too, the walling of the house—it is *dingding* in Tagalog as all along the Cordillera from Apayao to Baguio, with variants like *diding* occurring as far apart as Sagada and Upi, Cotabato. Except for these examples, however, Isneg architectural terminology has nothing in common with the rest of the Province, unless we hear an echo of their *talaxatag* in the *tarata* floor of the Bangad 'olub. (It is to be noted, however, that the Isnegs also have a smaller house constructed in their plantations for seasonal occupation, whose shorter floor-supporting posts are called *tukid* like the pan-Montane *tokod*, and whose *bansag* bamboo flooring is surely cognate with the *basag*-flooring of the Salegseg house.) Below the roof, there are almost no pan-Montane terms. The Ifugao *bughol* (rafters) reach western Bontoc, and their *kuling* (girders) as far down the Chico as Bangad, while certain Kalinga terms have fairly wide local circulation (e.g., their *bat-ang* joists or *pongo* rafters), but a common feature like the two girders present a whole list of unrelated forms—e.g., from south to north, *ballangan*, *kuling*, *ina*, *pyayon*, *mamansagangan*, *andixiyan*—and even the two stringers distinctive of the Northern Strain are variously called *tapi*, *anisil*, *fuchis*, and *kinalayan*. This variety is to be expected inasmuch as it was not house styles that were transmitted from one people to another, but individual features and building techniques,—for which reason the rather awkward term "strain" has been adopted in this paper rather than "style."

Granaries throughout the Mountain Province are called *alang* except in the Kankanay speech of the western shoulder of the

Cordillera which shares the Ilocano *agamang*. The word *agamang* itself is rather mysterious, for the Ifugaos apply it to the communal segregated dormitories whether they occupy big *bale*-style houses or mere *abong*-huts, and the Ilocanos themselves—at least in La Union—distinguish another shape of granary (one with vertical rather than slanting sides) as *salosal*. In the absence of further data, perhaps the following flight of fancy might be entertained as a tentative explanation. *Agamang* was originally a kind of granary (*alang*) which was adopted by the Ifugaos as sleeping quarters but eventually developed into a standard house to which the common word for house (*bale*) was applied, leaving the earlier term *agamang* attached to the earlier function.

The Spaniards made several forays into the heart of the Cordillera during their first century of occupation, but unfortunately only one account of the buildings they encountered has been published. This is the report of the “Expedition to the Mines of the Igorrotes” by Don Alonso Martin Quirante in *the Audiencia de Filipinas: cartas y expedientes de los oficiales reales de Manila vistos en el Consejo, años 1623 á 1641*, which describes the dwellings of the Antamok mining region as follows:

The houses in which those Ygolotes protect themselves from the inclemencies of the weather—which is intolerable, both because of the sun when it shines, and from the rains and cold—are very small, built of straw and short wood. They have no walls, for the roofs serve as everything, extending from above even to the ground. They sleep high up, on some boards or planks roughly put together. The doors of their houses, which are very small, are so low that one must get down on hands and knees in order to enter them.¹⁴

This is a reasonable description of a building still to be found in the Mountain Province—the work camps constructed by the “*camineros*” along the national highway, a sort of double lean-to whose triangular open ends are often closed by grass-thatched walls into which a low door is let, and which frequently attains such respectable proportions a man can stand erect beneath the ridgepole. We suggest that this house was called an *abong* or or *afong* by those who inhabited it, and that its lineal descendants are to be seen in the *atos* of Bontoc to this day.¹⁵ About the

14. Blair, E. H., and Robertson, J. A., *The Philippine Islands*, Vol. XX, pp. 267-268, Cleveland, 1904.

15. The Keesings in 1934 concluded that the *abong* was an older

only domestic chore necessary in even inclement weather which would require more headroom than such houses provide is threshing rice with a mortar and pestle. But it is to be noted that many of the present-day *abong*-dwellers live on root crops or corn, or did so until recently—the Nabaloi, some of whom consider *avung* or *awung* the same as *bali*, the Kalinga Gaddangs of Bacari, where *afung* alternates with Ilocano *balay*, and the Ilongots of Baler in Tayabas Province, whose common word for house is *abung*.

The contrast between the Benguet *abong* and the Ifugao *bale* of a century ago can be detected in Buzeta's 1850 *Geographical Dictionary of the Philippines* in the following description of the *igorrotes*:

Those of the Bauguet [*sic*] valley live in cabins of bamboo which form a triangle with the ground, covered with a grass called cogon, receiving no more light than by the door, which is tiny; for which circumstances they are rather dirty. Those who inhabit the center of the Cordillera have a somewhat better construction; they use pines which they cut by the strength of their *tatibong*, a unique tool they employ and which serves for all their work as well as their arms, being a blade with two edges and a Roman point.¹⁶

Houses enjoying the features of the Southern Strain of architecture are well-fitted to a cold climate with heavy seasonal precipitation favoring the mildew of stored grain, and the employment of a short timber. The stocky proportions of the three-or-two-on-four underpinning provides a foundation of pillar-like stability, which in its Kalinga adaptation endures almost permanently while bamboo walls and grass roofs are repeatedly renewed around it. We have already called the Ifugao house the prototype of this architectural school, both because only in Ifugao is one term used for both houses in general and this particular style, and because it is difficult to imagine how such a concise and ingenious form could have developed out of the often devious Lepanto-Bontoc variations. This is especially true in the case of the roof, where so advantageous a feature as the ridgepole and its two smokeholes would hardly have been given up deliberately. There is, however, a type of compact four-legged

form of dwelling than the wooden *balei* on posts, and speculated that the world itself may derive from early Negrito speech. (*Taming Philippine Headhunters*, pp. 51-52.)

16. Buzeta, P. Fr. Manuel, *Diccionario geográfico, estadístico histórico de las Filipinas*, Madrid, 1850, Vol. I, p. 52.

building with disk-shaped rat-guards which would have no need of smokeholes at all—a granary—and we submit that some sort of granary was the ultimate ancestor of the whole family of southern Cordillera housing.

The geographic provenance of the Northern Strain is less easy to pinpoint, although the functions of most of the features are clear. The bowing of the rafters into a high arch gives head-room but permits the roofing to be carried well down the sides. The complete independence of the floor structure is understandable in terms of bamboo, a strong and useful plant but one which does not lend itself to easy or firm mortising. The origin of the three-section floor in two levels, however, an essential feature of northern houses, is less easy to understand. The side areas are naturally more used for storage than the center and sleepers lie across the center section with their heads pillowed on the upper (indeed, in Manangol the stringers are called *pongan*—pillow), but the urgency with which the northern architect works this feature into his houses is hard to explain by recourse to such minor considerations. Nor does it seem plausible as an incidental feature consequent to the peculiar Isneg interlocking floor joists and roof posts—to say nothing of the fact that the Apayao house would appear rather too complex to serve as the prototype of the other varieties bearing the Northern Strain. Rather, one would suspect some common parent from which the Kabugao, Mabaca, and Kalinga *kulub*-style houses sprang and matured independently. Perhaps a clue is to be found in the honor which was presumably afforded the end platforms in the old Isneg houses, and the origin of the two-level floor sought outside the Philippine archipelago.

CONCLUSION

Two distinct types of simple houses were inhabited by the old swidden farmers of the Cordillera Central—the *abong*-style by the Kankanays and proto-Bontocs of the southwestern heights, a double lean-to built directly on the ground, and the *kulub*-style by the Kalingas of the northeastern foothills, a square bamboo shed with an entrance at ground level and a partial floor at two slightly different levels on an independent set of posts. An original granary-shaped house standing on three joists on two gir-

ders on four posts developed in Ifugao, and spread to Benquet (reaching the Inabaloi of the upper Agno valley only after they had already adapted for themselves a kind of lowland-style house), Lepanto and Bontoc, where it underwent local modifications: it is enlarged by increasing the height of its attic and adding a ridgepole and smokeholes, and by fencing in the ground level under the eaves where most domestic chores were done. In mild-temperated Bontoc the inhabitants moved down to the ground floor, the upper chamber reverting to a granary, while in the higher villages this whole ground floor was tightly walled in. Along the northern edge of the Cordillera another type of wooden house developed or was introduced—one with a high gabled roof with bowed rafters, wall-boards in tiers to fill in the gables, annexes or porches at the ends, and an independently supported floor in three lengthwise sections. On the heights of the Cordillera in the upper Chico valley these two techniques met and produced another original type—an octagonal house achieved by extending each side of the square southern house and closing in the areas in between, but keeping the curved rafters and three-section floor of the northern house.

If this thesis is correct, the Ifugao granary-house and the Kalinga octagonal house should not be encountered outside northern Luzon, and it would definitely be enhanced by the discovery outside the Philippine archipelago of a four-legged granary with three floor beams laid across two, or a house with three-section floor with low platforms along the sides.

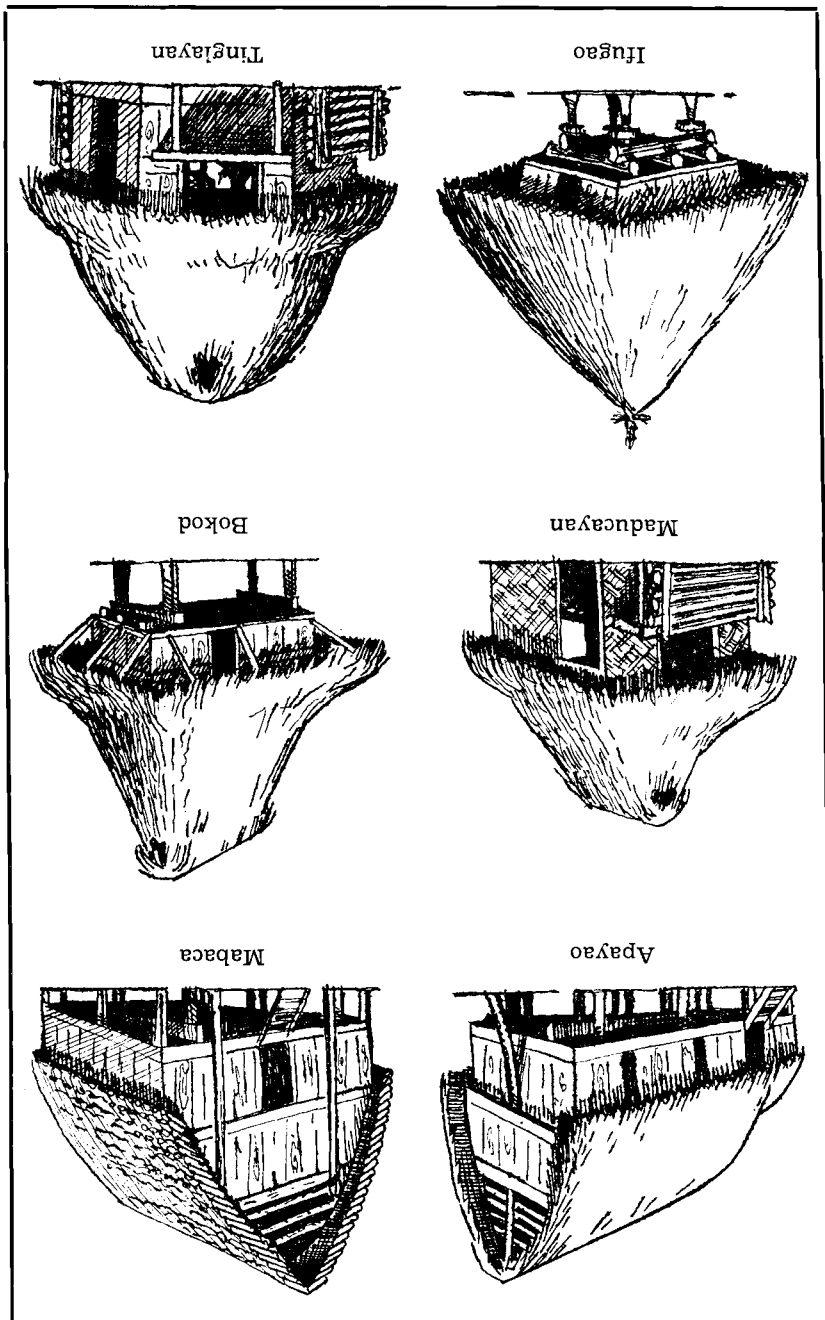
Sagada, 15 March 1962

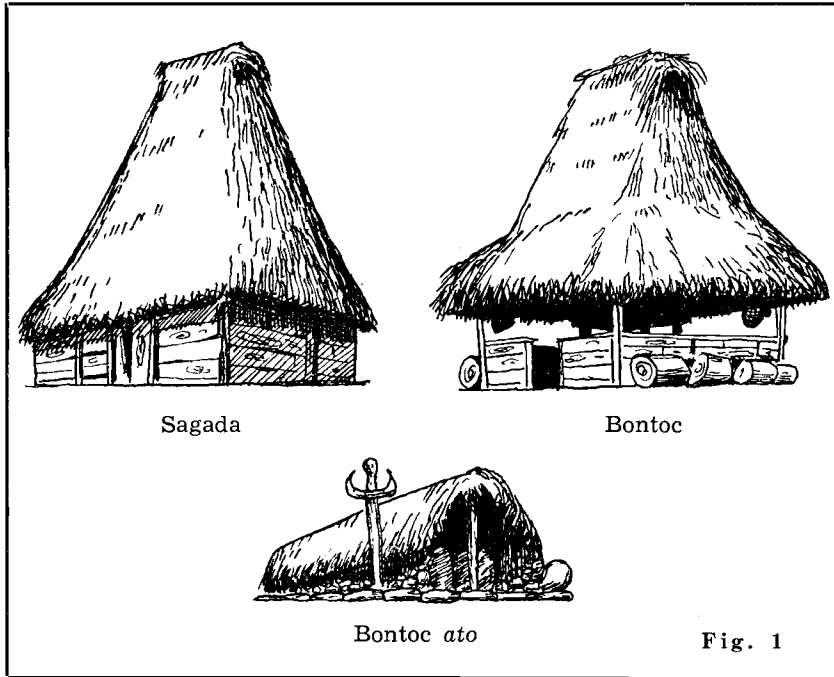
DIAGRAMS

- Fig. 1. Representative houses of the Mountain Province.
- Fig. 2. Ifugao *bale*-style house. The diagram is a composite of the house of Vice-Mayor Camilo Anannayo of Hungduan in *sitio* Bokol, examined on 22 April 1954, and that of Mr. Marcos Guin-hadchan of Mayaoyao in *barrio* Balangbang, examined on 27 April 1954; terminology taken from "Ifugaw Villages and Houses" by Francis Lambrecht, CICM, *Publications of the Catholic Anthropological Conference*, Vol. I, No. 3 (April 1929), pp. 117-141.
- Fig. 3. Sagada *innagamang*-style house. The diagram represents the house of *Lacay* Bagtan of Picong, Sagada, examined on 7 July 1956, with terms supplied by the owner.

- Fig. 4. Bokod *tinabda*-style house. The diagram represents the house of Mr. Karimpal in *sitio* Bagtang, built late in the 19th century, examined on 31 December 1960, with terms supplied by Mr. Louis Angel, local industrial arts instructor.
- Fig. 5. Isneg *binuron*-style house. The diagram is a composite of an unoccupied house built about 1905 in *barrio* Magabta, Kabugao, and another unoccupied house in *sitio* Malitaw, Namultugan, examined on 18-20 April 1956; terminology taken from "Isneg Buildings" by Morice Vanoverbergh, CICM, *The Philippine Journal of Science*, Vol, 82, No. 1 (March 1953), pp. 77-108.
- Fig. 6. Bangad *fnaryon*-style house. The diagram represents the house of *Lacay* Fakas, built early in the 20th century in *sitio* Challog, examined on 29 September 1960. with terms supplied by the occupants.
- Fig. 7. A comparison of houses in the Southern Strain.
- Fig. 8. A comparison of different Kalinga house-styles.
- Fig. 9. A comparison of different Kalinga floor-plans.
- Fig. 10. An Isneg granary (after Vanoverbergh).

Fig. 1





Sagada

Bontoc

Bontoc ato

Fig. 1

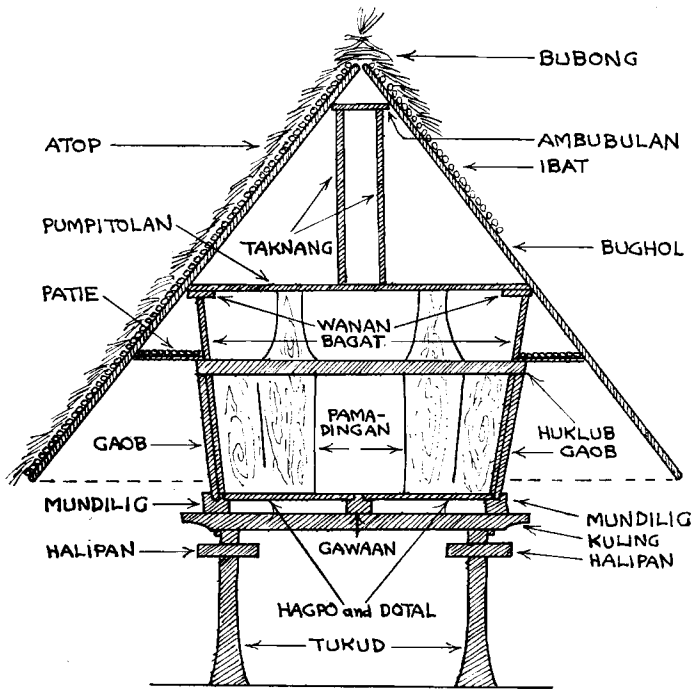


Fig. 2

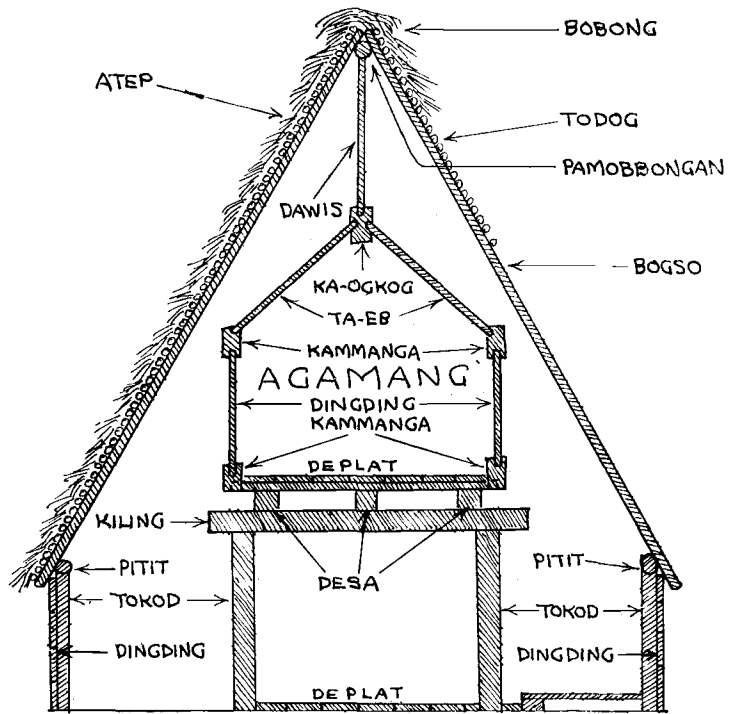


Fig. 3

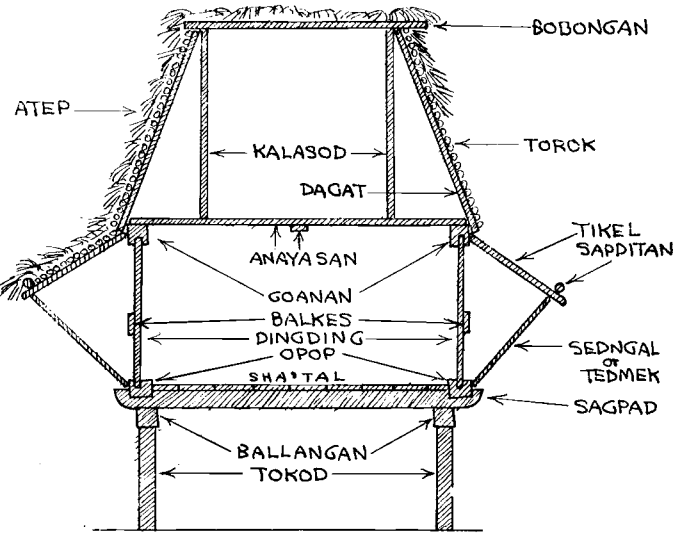


Fig. 4

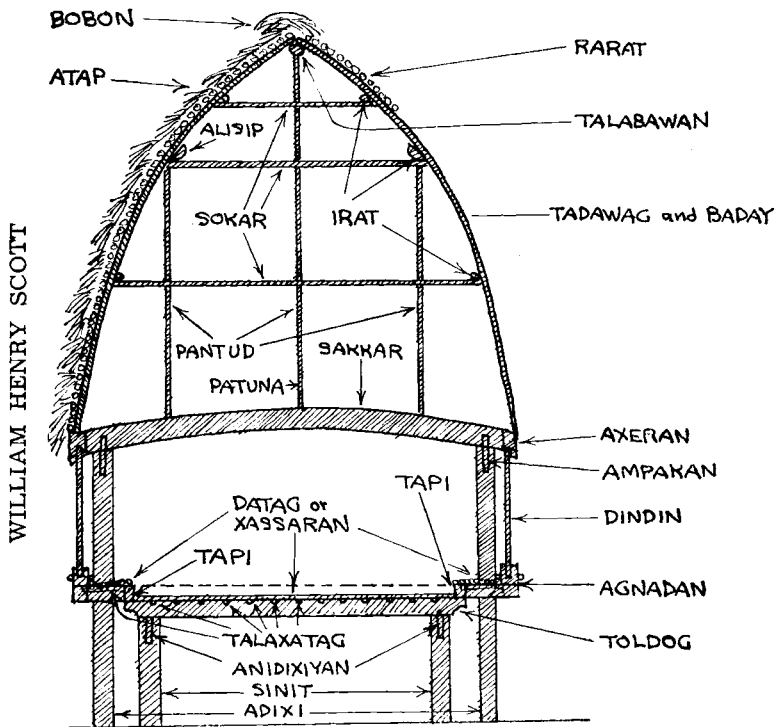


Fig. 5

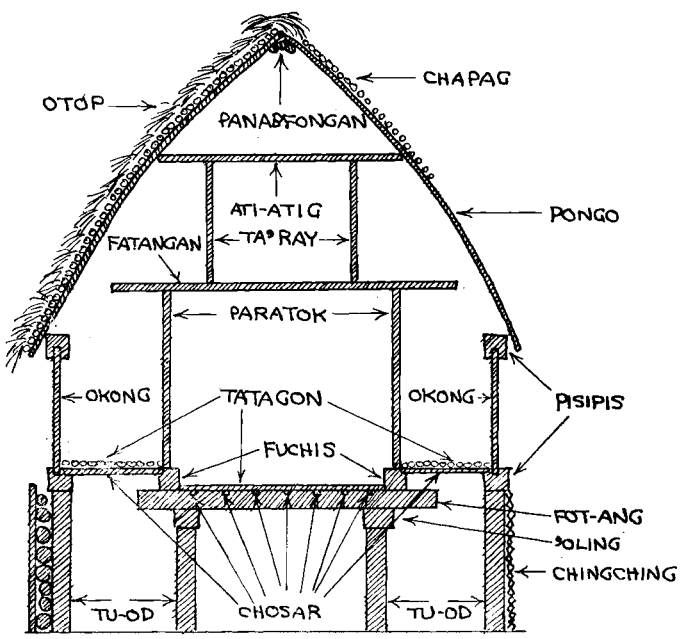
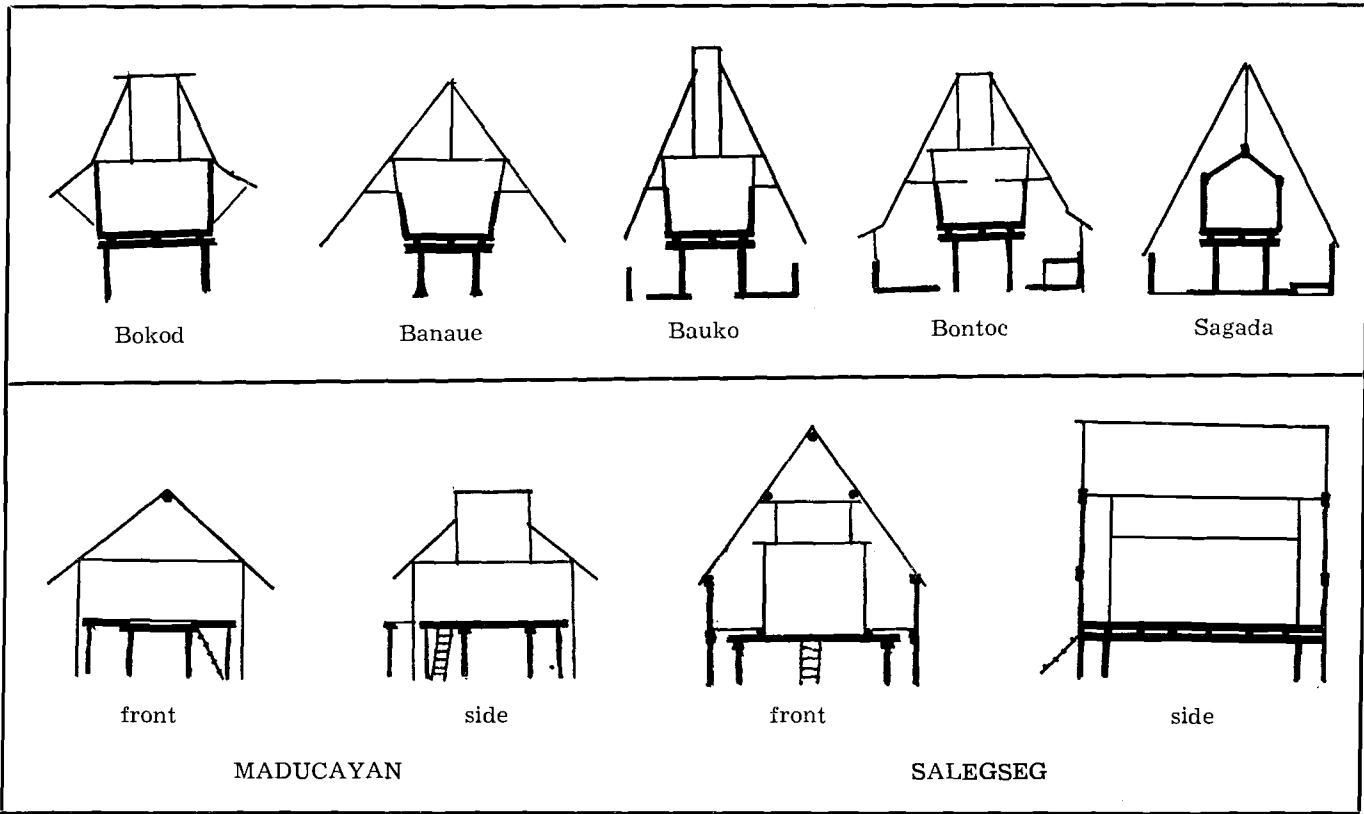
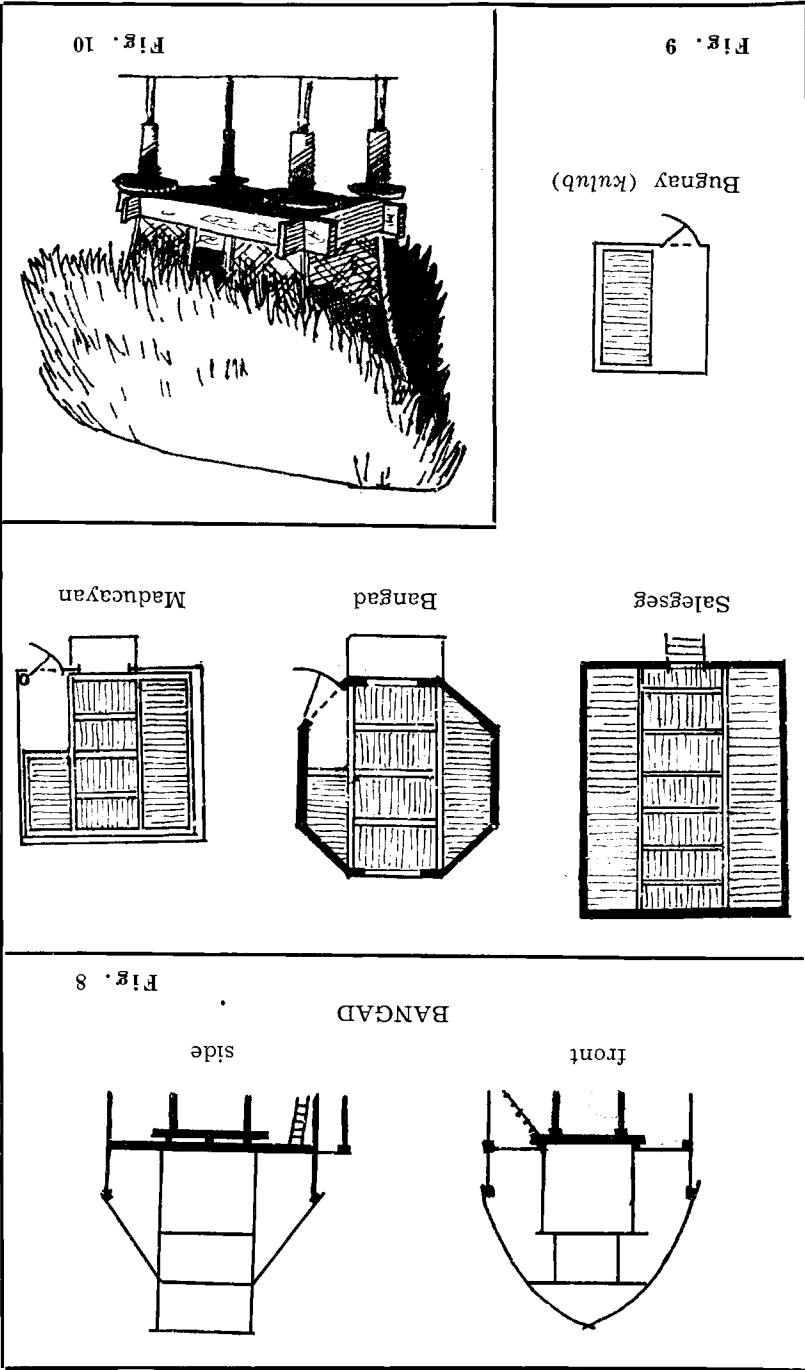
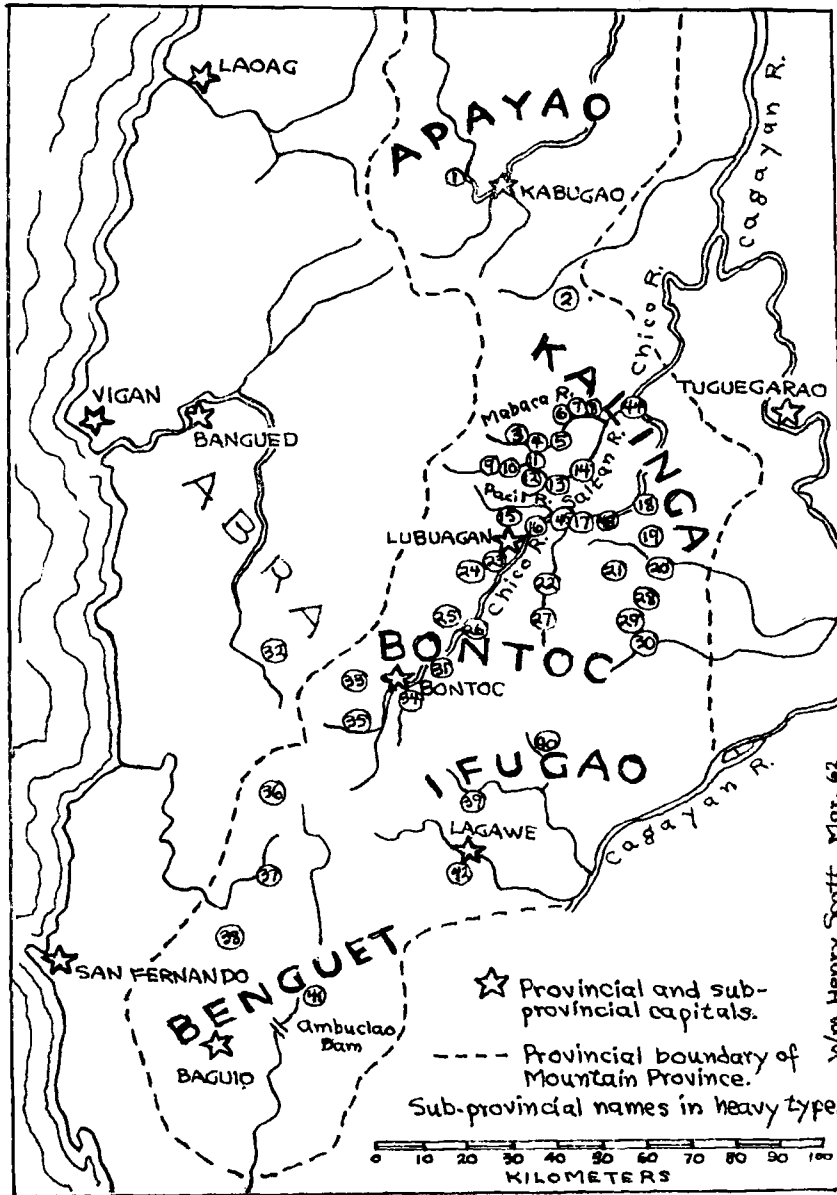


Fig. 6





Map of the Mountain Province and Cordillera Central Region of Northern Luzon in the Philippines.



KEY TO MAP:

Amasien	8	Lepanto	36
Asiga	7	Limos	14
Bacari	20	Mabaca	3
Bakun	37	Maducayan	29
Balbalan	13	Manangol	23
Banaao	10	Mayaoyao	40
Banat	43	Namultugan	1
Banaue	39	Naneng	17
Bauko	35	Natonin	30
Bitwagan	31	Pacil	45
Bokod	41	Pangol	21
Bonot	28	Pinokpok	44
Bontok	6	Ripang (Conner)	2
Botbot	25	Sagada	33
Buaya	4	Salegseg	12
Bugnay	26	Samoki	34
Canao	5	Sumadel	24
Dakalan	27	Tabuk	18
Dantalan	15	Talalang	9
Kalakad	19	Tanglag	16
Kiangan	42	Tanudan	22
Kibungan	38	Tiempo	32