

THE BUILDING OF THE UGANDA CATHEDRAL

By F. ROWLING

It is recorded of Dr Livingstone that one day, when a friend spoke of the difficulties of his work, he replied, 'Difficulties ! What are difficulties ? Things to be overcome.' Among the many and varied difficulties which beset missionaries in their work none are more common than those connected with the building of houses, schools or churches. Each mission, oftentimes each missionary, faces in solitude problems which have been faced in other fields before. Yet an interchange of experience and of sympathy concerning building work is very rare. The following article is written in the hope that lessons learned in the building and rebuilding of the great cathedral in Uganda may prove interesting and possibly instructive to missionary builders in other lands.

The first Uganda 'cathedral' was a purely native structure, looking in the distance like a huge long haystack. It consisted mainly of a thatched roof, resting on poles straight from the forest, set in rows about six feet apart, and rising to about forty-five feet high along the ridge. The thatch came to within about six feet of the ground, and the walls, lining along the second row of poles, were about ten feet high along the sides, made of reeds sewn over grass : the ends were about twenty feet high, and the building some 180 feet in length. This was blown down in a gale in October 1894.

A similar 'cathedral' was quickly rebuilt on the same site ; it was taken down in 1901 to avoid the fate of its predecessor, as the poles rapidly rot in the ground, and the

lack of cross walls or buttresses makes such structures liable to be overthrown suddenly in a tropical storm.

The third structure was of sun-dried brick, well built, with three pyramidal spires over the centre and transepts; it had a thatched roof, lined with reeds well polished and was a typical African building of unique architecture. Built on one of the highest hills, it stood for years as a testimony to the genius of the designer and to the earnest labour of the Baganda Christians. The dedication on May 31, 1905, was a festival day never to be forgotten.

This building, however, though well protected by conductors, was struck by lightning in September 1910, and completely burned down in less than an hour. The news reached Bishop Tucker at Aden, on his way home, and he immediately set to work to arrange for a new and more permanent building. Friends at home contributed some £10,000, the understanding being that the Baganda should collect a like sum on their part.

Designs were prepared by Professor Beresford Pite, F.R.I.B.A., for a building intended to be fireproof, substantial and permanent. These designs were published in the *Builder* in 1911, 1912 and 1913. The intention was to make use of everything which could be made in the country and by the natives, only such materials as cement, metal fittings, glass, etc., being imported.

The writer returned to Uganda in August 1912, and was appointed secretary to the Cathedral Building Committee, which consisted of about eight European leaders and some twenty Baganda, headed by Sir Apolo Kagwa, K.C.M.G., who has been untiring throughout in his efforts.

INITIAL DIFFICULTIES. The hill top proved too small for the full design to be completed, so about six feet of the top had to be cut away to provide an area long enough for this purpose. Then it had to be arranged that the 'east' end should face the north-west, so as to avoid the weight of the heavy 'west' tower coming on the steeper edge of the hill top. A good site thus became available, and soundings

proved the ground below suitable for the foundations at about eight feet depth. The concrete for these had to be provided, and suitable stone for this was not easy to find near at hand. Some which was quarried, and required sledge-hammers to break up, when exposed for some months in heaps ready for use was found to be friable even with the fingers and quite unsuitable. The ironstone similarly was condemned after testing in England; though regularly used for foundations and walls in ordinary houses in Uganda it would not stand the pressure it would have to carry. However, the right stone was found in the end, though most of it had to be quarried over four miles away.

This brought another difficulty to the front. The old footroad was far too steep to allow carts to be brought up it, and almost all the hillside was covered with houses or plantations, whose owners or occupiers had prescriptive rights. The first thing was to survey for a spiral road not involving any heavy gradient, after which tactful negotiations were needed to win permission from those whose property had to be cut into or whose houses had to be demolished. This too was settled, and a road finally completed on which even bullock carts could be got up with reasonable loads, and motor cars could run up comfortably. It involved making many culverts, as the tropical rains cause much flooding on steep large hills and constant watching was needed to keep the waterways clear and to avoid 'washouts.'

MAKING THE BRICKS. Exhaustive digging for clay suitable for making good sound bricks had meanwhile been carried on and samples sent to England for testing and burning. There are no deep beds of clay, as in England; all the most suitable kinds are found in the swamps, alluvial soil washed down by the rains and settled into beds varying from three to ten feet deep. In the rainy seasons these fill up quickly with water, causing great delays and much expense in digging the clay. It was also essential to get the clay from the nearest suitable spot in order to reduce

the cost of carriage, while, on the other hand, this spot must be near some forest, as the cartage of firewood for burning would again add largely to the cost of the bricks. Yet the forests near the centre of population, where the cathedral is, have mostly been cut down for firewood years ago. So the problem was not an easy one. Further, after starting one brickfield, and building the sheds needed, the report from England advised that the specimen of clay from a different one had proved to be the more suitable, so the sheds had to be removed and rebuilt near this better clay.

For the firewood, the Kabaka (King) of Uganda generously gave a concession to the building committee to cut down what was needed for this work, and a proper agreement was drawn up and registered to this effect. This allowed cutting in a forest within about a mile from the brickfields and reduced cartage to the utmost. The brickfield was about four and a half miles from the cathedral site, half of which was uphill, and about one mile only on the government metalled road. So again it was necessary to improve the faulty section by adding broken stone along it, and digging the needed culverts, all of which meant further expense.

Readers will probably be mentally wondering why a contractor was not employed for all this. No one could be found to tackle such a problem, except on conditions too onerous for the committee to accept.

We were next advised that we ought to get out a brick machine, which in the end would prove cheaper and better than hand labour, when four or five million bricks were needed. After long correspondence and delay, the machine, with Hornsby oil engine to drive it, arrived in the country, and the next problem was how to get them both fitted up. No cement for foundations was to be had, except some very old stuff which had been in casks in a verandah for about three years, and belonged to one of the regents. So this was bought, and broken and ground down to powder, using double the usual quantity in the concrete. We were

of course told by the experts that it would be quite useless, but happily the result disproved this warning and the foundations stood perfectly well. There were many added difficulties in fitting all up : e.g. the water tanks had been sent out in sections, with no rivets for them, nor any soldering material for the joints. Parts of the machinery were broken, bolts were missing, tank flanges cracked, etc. Yet one by one all these difficulties were overcome.

Then came the training of the native workmen in how to deal with the bricks as they came from the machine, as slackness in this means spoiling large numbers and constant stoppage of the engine. Yet with endless care and patience this too was carried out, and we got most loyal help from some of our native foremen who had been in charge of the workers when making bricks by hand labour. Kilns were built of sun-dried brick with strong buttresses, and using burnt brick only for the furnace arches and similar parts. These were roofed with sheet iron on palm-pole frames well above the kiln top. After many trials the men managed to turn out good well-burned bricks, which is by no means easy with half-dried wood for fuel.

A brickmaker was sent later from England whose practical knowledge was of great value, and who by more careful burning gradually reduced the time needed and speeded up the making as well. But unfortunately the climate did not agree with him and he soon had to return home. But all this prepared the way for getting a contractor later to take over the work.

TRANSPORT PROBLEMS. One of the greatest of African difficulties is always that of transport, in unmade countries with few or no cart roads. In earlier days all the transport was wholly by porters, along the narrow native tracks, in loads of fifty to seventy pounds per head. Heavy poles were carried by gangs of up to 200 or more at once, with cross sticks about four feet apart, two or three men aside to each stick, with relays trotting alongside for reliefs.

Bullock carts were introduced into Uganda some years

ago, largely by the Indian traders, and in normal conditions these prove the most economical in transport work. But bullocks can only be regularly worked thus in early morning and late afternoon, feeding in between, and workmen do not like these hours when they see that their fellow-workmen are resting or cooking then, or have not yet started work. The fact that they rest while others work does not seem to appeal to them as balancing matters. We bought bullocks, trained them and the men, got the carts, and carried up thousands of bricks ready for use, over our new-made roads. Later on came the cattle plague, and closed the roads, and again men had to be employed to haul the carts, but this time it was done by contract at so much per 1000, so they stuck to it.

We were advised to get a small tractor, but the great cost, the need for a European driver, expense of repair and upkeep, and the added need of a second tractor to meet a breakdown made this financially impracticable.

BUILDING DIFFICULTIES. After all these matters were well forward, the foundations were pegged out and digging begun. The foundations were of concrete, eight feet wide and two to three feet thick, reinforced with some steel rails which had been brought out by a company for a mono-rail, and not used. The cement was sent from England, but the rough treatment in unloading from the lake steamer burst nearly all the barrels and much was entirely lost. A quantity of the rest was damaged by damp, and could only be used later on for flooring, cement mortar, etc.

Soon after this, when all the earlier difficulties had been disposed of, we were able to secure a contractor for the foundations only, but for other reasons he had to give up soon after and arranged with a successor to carry out our contract. Every stage of the work had to be most carefully watched, so we engaged supervising architects for this, and our own helpers and members of committee looked keenly after the practical part, helping with the supply of labour and giving advice as to materials. The

long preliminary work described had cost about £3000, and the foundations took another £5000, so when these were well forward we had to take stock of our position, and see what must be done, if the building was to be carried out for anything like the £20,000 originally planned.

CONSTRUCTION PROBLEMS. The first designs provided for concrete vaultings throughout, roofed over with reinforced concrete, so as to be quite fireproof. But the country is in the earthquake zone, and though the tremors are not usually severe, yet they are quite enough to crack concrete floorings. Further, there was the great cost to be considered, as native workmen are not skilful enough for this special work, and all the best engineering advice from experienced departmental heads was to the effect that the vaultings and roof would be almost certain to crack in any earthquake at all severe, and it would be almost impossible to get them rainproof again. Thus, after much discussion, it was found necessary to give up the concrete and build a wood framed roof for tiling. The main west tower and Lady Chapels had to be left out, on the ground of cost, yet even then the contractor's estimate for the structure (apart from foundations) proved that further reductions must be made.

A critical examination of the estimates was made, and after long consultations with the architects and contractor, it was finally agreed to proceed with the building on the basis of 'schedule rates'—fixed prices per cubic foot all round, yet with concessions for rise of prices or cost of labour. This finally reduced the total estimate to about £28,000, and the Baganda agreed to do their utmost to raise the extra sum needed. The height of the walls was reduced, new designs made for the framed roof, and drawings prepared for the whole which were warmly approved by the committee as securing a cathedral well fitted for the needs, and complete in itself even though modified so greatly from the original plans.

WAR, AND MATERIALS. The war began before the

foundations were completed and many added difficulties followed this. The labour problem especially became acute, as so many men were called for to supply the needs at the front, and prices began to rise, though at first slowly. Still, it made concessions necessary in various ways, and added to the time and cost. Yet later on some return came in for this, as the loyal support of the Baganda Christians and chiefs so far won the approval of the government that when the local pressure relaxed in 1917 they granted a special concession that all workers for two months or more on this and similar church building should be excused, for that year, the annual month's work due for government. This kindly concession was highly appreciated, and the reasons clearly explained to all concerned.

The four central pillars were originally designed for marble, which was to have been brought ready worked from Italy. This was made impossible by the war, and the lack of suitable building stone made the problem of what substitute to use most difficult. Concreted steel pillars were equally ruled out by the war. There are great blocks of good granite in many parts of the country, but this is so hard that the cost of working is prohibitive, besides needing special skilled labour, say from Aberdeen. So men were set to hunt for good stone in every district, and to send in samples. The writer motor-cycled some 600 or 700 miles to examine, on reports sent in, but without success. Then, on holiday at a coffee plantation some fifty-five miles off, he found what seemed 'good stuff,' so when all else failed samples were sent for, and they proved to be a good sandstone, most suitable for the pillars.

Indian masons were secured from Nairobi, the stone quarried, hauled in flat carts by labourers and worked up on the site. After many months these four pillars were completed, at a cost of about £300 each. They caused great wonder to the natives, being the first time dressed hard stone had ever been used for building in the country. Some Mohammedan chiefs, on being shown round by Sir

A. Kagwa, remarked to him—‘Now we know your God is the true One, since He has given you such skill as to cut and dress stone, and build with it like wood.’

Roof timbers were also most difficult to secure, both on account of the large sizes needed and no stock of seasoned logs being available from which they could be cut. Yet here and there a large tree was found, either dead or felled some years before, and the sawyers were set to work on these, so that gradually the stock required was brought in and stored, ready for the day when the walls should be completed. General Botha made time, during a hurried visit to Uganda, to run over and go round the building about this time, and was amazed to find such wonderful progress made in such a fine piece of work in the country which was almost unknown to Europeans only forty years ago.

FINANCIAL PROBLEMS. Some of these have been already indicated. The raising of even £10,000 seemed a herculean task, in a country where the ordinary workman's daily pay is barely fourpence. Yet the fact remains that in seven years' time the Baganda Christians have actually paid in over £18,200 in cash, and have promised to carry the work through. Many of the chiefs have been sending in regularly no less than thirty per cent of their estate rentals during those years, and are still continuing this, quite apart from the ordinary church collections and maintenance of their native teachers, missionary workers, and schools. A system of stamp collecting was introduced, to make it easier for the poorer members to help with sums from 1½d. and upwards; in some districts this has worked well.

Comparing the above rate of daily wages with that of workmen in England, it will be seen that the raising of the £18,000 required, by the Uganda church members, would equal in effort the raising of at least £250,000 in an English diocese. This is an interesting point, often lost sight of when statistics of native contributions are published.

THE ROOFING PROBLEM. This has been partially noted already. The old thatched roof lined with reeds was so

very inflammable that though very picturesque and entirely 'native' it could not reasonably be considered for such a permanent work. It has been shown why concrete was also considered impossible. There remained tiles, and of late years the French Roman mission has been making these, between Kampala and Entebbe, where there is a fine bed of suitable tile clay, with forest near—almost the only suitable bed of which the writer has heard in Uganda. The European lay brother in charge was sent to Belgium for special training in the work, and the needed machinery brought out, so that the best 'Marseilles' tiles might be made on the spot.

These being available, the wisest course seemed to be to use the local material, following the principle noted earlier. The price has almost trebled since 1914, yet unless or until some other source of supply is found, they have the monopoly. The almost entire cessation of imports of iron sheeting has of course most to do with this rise, as for ordinary roofing the price of tiles must conform to that of iron, or the former will not be bought. But iron sheeting for a church roof is most unsuitable, as the noise from heavy rain makes it almost impossible for the service to be heard or followed.

The entire roof is boarded with local woods under the tiling, and in these special care is needed to select only the best kinds. Our skilled native members of committee were most useful in this, as when one firm submitted some fine-looking samples for the lining, they said at once—'Don't use that kind : the large boring beetle attacks it.'

FURTHER PLANS. The latest news is that the roof is now almost completed, and it is hoped that the consecration may take place about June 1919, though much work will remain to be done even then. The steel frames for the windows could not be sent out, owing to war conditions, though by special permission the plain bars were allowed for export in September last, to be made up locally : also just enough glass for the top windows of the central

dome, so that this might be completed and the scaffolding removed. It is hoped that the rest may soon be obtained.

It is proposed to have a few stained glass windows when funds allow, in memory of Bishops Hannington, Tucker, and other leading workers, native as well as European. These will be erected later, as gifts come in.

The cathedral is about 210 feet long, with central square of ninety feet each way under the dome, which rises to about ninety feet high at the crest. The chancel and nave are forty-eight feet wide, and the ridge fifty feet high. As most of the native members sit on the open floor, it will hold some 3000 when full: there will be a few forms as well, and the chancel will be properly fitted with stalls for the choir, dignitaries, etc. Half of the chancel will be screened off to form the Hannington Chapel for European services, accommodating upwards of 100.

All the furniture will be of native make: the large pulpit, the bishop's throne and part of the choir screens have been already made, the first two items at the King's School, Budo, largely by the boys there, while other schools do sections as they are able.

It is hoped that the above account may help some other workers. The sustained and combined efforts of many tribes or nations in a large diocese on one task all help to make them realize their unity in the faith, while their united worship in a cathedral they all helped to build should draw them still more closely together during synods or conferences, and tend to remove differences, to heal divisions and to strengthen them in every effort for the extension of the kingdom of God to whose glory the whole building has been raised.

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