PREPARATION OF COCO-NUT SHELL CHARCOAL.

Details of various methods for the preparation of charcoal from coco-nut shells have already been published in this *Gazette* (Vol. 7, No. 1, Vol. 4, No. 2, Vol. 4, No. 1). Recently, another method which is being used successfully in this Territory and which has advantages over all the other methods so far described has come under notice. The shells are burnt in 40 gallon oil drums, the procedure being as follows:—

Preparation of Drum.

The drum should be free from any considerable leaks and if the bungs are of fusible metal they should be replaced by iron ones, or the bung holes closed by welding. The bottom should be cut out leaving a lip 2–3 inches wide around the outside. A circular cover is made of heavy galvanized or 16–20 gauge black iron and may be a flat disc or preferably slightly conical with a rise of about 3 inches in the centre. If a cone is made the seam must be welded or otherwise made airtight. The cover should be of such size that it will just fit inside the rim of the drum and rest on the 2 inch lip. A few (4–6) $\frac{1}{8}$ inch holes should be drilled round the top rim so that nails may be inserted to hold the cover in place when sealing the kiln. These holes must not be low enough to penetrate into the interior of the drum, thus allowing air leaks after sealing.

Site for Burning.

The drum is set up on level ground, preferably where it will be somewhat sheltered from any strong wind; but not so sheltered as to prevent air currents from reaching it. If improperly stoked the drum will give off dense volumes of white smoke, so that the burning should be done where the smoke will not become a nuisance. If stoked properly, there is practically no smoke.

Shells.

The shell should be clean, fresh, half-shells; old, rotten shells that have been lying about for months will give a low yield, and shells that have been wet with sea water must be excluded.

Starting up.

A single layer of shells is put in the bottom of the drum and a small fire of kindling wood started in the centre.

Burning.

As soon as the shells catch and begin to burn fresh shells are added, one at a time and at a rate controlled by the results produced. This rate of feeding is the important factor.

If the rate of feeding is too slow the shell will be over burnt. This can be judged by the colour of the flame which changes from yellow to bluish, and by the appearance of the charcoal which will be seen glowing and breaking into small pieces and becoming covered with white ash. The drums will also become intensely hot. The final product will have a low volatile content, but the yield of charcoal will be low.

Too fast a rate of feeding will extinguish the flame, and give rise to dense clouds of white smoke, the temperature of the drum will fall considerably and the fire will either be completely extinguished or give a product of half burned shell containing a high percentage of volatile matter. The yield of charcoal will, of course, be high under these conditions.

As the drum fills it will be found that a somewhat faster rate of feed can be maintained, especially if the shells are thrown in so as to stack up on the leeward side of the drum, where they become pre-heated before rolling down into the burning zone. It is advisable to have a torch, consisting of a roll of oil soaked bag or similar material handy, so as to ignite the gas again if it becomes extinguished through too rapid feeding. With continuous feeding about 300 lb. (5 sacks) of half shells can be burned in a 40 gallon drum in five hours, and one man can probably burn more than one drum at a time if drums and shell are conveniently arranged.

Finishing Off and Sealing.

When the drum is nearly full, the feeding of shell is discontinued, and burning continued until the yellow hypocarbon flame has practically disappeared, giving place to a blue or purple monoxide flame. When this point is reached the lid is put on, fastened down by inserting nails or wires and sealed by placing a few shovelfuls of earth on top. It is essential that the air be completely excluded from the charcoal during cooling. The drum and contents are then allowed to cool undisturbed—probably four to six hours will be necessary, for, if the burning has been properly conducted, the lower part of the drum will be cool by the time it is filled.

Opening up.

On opening up great care must be taken to avoid allowing earth to fall into the charcoal.

Yield.

A normal yield is 23–25 per cent., i.e. 70–75 lb. charcoal per drum, while the volatile matter in the charcoal should be between 5 and 15 per cent. R.C.H.

NEW COPRA CABINETS.

In a *résumé* of coco-nut and oil palm investigations being conducted at the Coco-nut Experiment Station, Port Swettenham, in Federated Malay States, published in Volume XXVIII., No. II., of the *Malayan Agricultural Journal*, the following information is given:—

The new copra cabinets equipped with a jack-roof have proved highly efficient. A great saving in fuel is effected and the nut capacity per unit area of grill greatly increased. Three of these cabinets, Nos. 4A, 10A and 50A have been given systematic trials. No. 4A has a productive capacity of 3 piculs* per run and No. 10A of 7 piculs. No. 50A is a four-chamber kiln; each chamber has about the same capacity as that of No. 10A. With any of these new cabinets high-grade copra can be manufactured inside an overall time of two days, which is less than that at present necessary to obtain dry copra on existing kilns, either on estates or small holdings.

Experiments have shown that the gross weight of wet meat is not the only factor to be taken into account when computing the load of a kiln. The thickness of the meat may also have to be considered.

At a later date, it is believed that Mr. F. C. Cooke intends to publish particulars of these types of kilns. The publication of his article is awaited with interest.

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* 1 picul=133⅓ lb.