also in aqueous medium, involves a loss. Staining reactions demonstrated a strong affinity for acid dyes, like orange *G*.

Both histone and acetic acid-soluble basic protein were present in nucleoli, but only the latter in nucleoplasm, at the stage when the oocyte shows the greatest nucleolar activity as seen by an increase of the basophilia and the number of nucleoli[5]. Thus this non-histone basic protein seems to be the expression of a metabolic activity of the nucleus preparing to function in the synthesis which accompanies growth of the oocyte, as suggested by Pollister[8]. Possibly synthesized in nucleoli, this protein of non-histone type which is soluble in acetic acid should be able to influence the cytoplasmic activity through the nucleoplasm.

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Sterility in *Theobroma cacao* L.

POUND[1], during his 1937–38 expedition to the upper reaches of the Amazon, made a collection of *Theobroma cacao* L. types which he hoped would be resistant to witches broom disease, *Marasmius perniciosus* Stahel. These were sent to Trinidad as material for his breeding programme. In 1943 Posnette[2] visited Trinidad from the Gold Coast and obtained pods from these trees, as he was interested in their possible resistance to cacao swollen shoot virus.

With hand-pollination, Posnette soon found that the trees were all self-sterile but to a limited extent cross-fertile. In their cross-fertility they differed from the cultivated Trinidad population, in which all self-sterile trees are also cross-sterile, depending for successful pollination on self-fertile trees. The self-fertile trees in this Trinidad population cross readily among themselves and with the self-sterile trees[3]. No satisfactory genetic hypothesis has been advanced to explain this system.

The progeny of Posnette's crosses were planted at Tafo in 1945. An extensive programme of cross-pollination on the progeny has enabled us to formulate a genetic hypothesis to explain their sterility. In the types so far tested we have found that five alleles (designated $W1$, $W2$, $W3$, $W4$, $W5$) at a single locus are involved. The alleles differ in potency and follow the sequence $1 > 2 = 3 > 4 > 5$. The diploid constitution of the male and female parent determines the success or failure of the cross. The alleles exhibit dominance according to the above sequence.

In two plants which have a similar sterility mechanism, *Crepis fœtida*[4] and *Parthenium argentatum*[5], dominance is only exhibited in the pollen; the alleles of the style act independently. In these *T. cacao* types the female reaction, in addition to the male, is sporophytic and dominant, and so the reciprocal-cross differences found in *Crepis* and *Parthenium* cannot occur. The system we have found in *T. cacao* resembles the hypothetical one suggested by Bateman[6].

The cacao types differ further from *Crepis* and *Parthenium* in that the stylar tissue is not the site of the incompatibility. Failure occurs at a much later stage, possibly after fertilization of the ovules. Although the system ensures cross-pollination, it is at enormous expense in terms of reproductive material.

A full report of the genetics of sterility in these types and their relation to the system found in the Trinidad population will be published later. The present communication is published by permission of the Director of Cacao Research.

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Resistant Components of the Cortex of Animal Hair

THE possibility that there exists beneath the scaly layer or cuticle of animal hair another peripheral layer has been discussed both in these columns[1,2] and elsewhere[3,4]. The supposed layer has been named variously subcutis, between-membrane, and cortical mantle. The most convenient way to show that there does exist a resistant non-keratinous residue beneath the cuticle was described by Alexander and Earland[4]. Hair or wool is oxidized with weak aqueous peracetic acid and then extracted with dilute ammonia solution. The oxidation destroys the disulphide cross-links which stabilize the keratin, rendering it soluble in alkali. The non-keratinous residue consists of (*a*) thin tubes each looking like a cast of the cuticle and consisting mainly of the thin membrane, the epicuticle, which envelops the scales externally, and (*b*) a cortical residue, which seen from the side looks like a rather tenuous tube of cortical cells[2]. This latter was thought to be the new morphological component, the subcutis[4].

In order to make sure of the exact disposition of this residue within the cortex, the experiment has been carried out on cross-sections of oxidized hair. On treatment with ammonia, these cross-sections swelled to about three times their original diameter and the cortical residue was seen to extend network-like throughout the cortex and to consist of the cell membranes which originally bounded the cortical cells. There was no sign of a distinct subcuticular membrane. The material used in this work has been mainly human hair and wool fibres; but the accompanying illustration is of a portion of the cross-section