been shown in potato varieties by other investigators, indicating segmental interchange, which is well known to be of frequent occurrence in plants, such as the potato, which reproduce mainly by vegetative methods.

While this evidence increases the likelihood of autotetraploidy in the potato, it by no means constitutes proof. Studies of the nucleoli and their relation to the satellites have given such clear evidence of allo- or autotetraploidy in many other plant genera that a similar study of nucleoli in the potato is obviously called for. If, following the Feulgen stain, a green dye is used after an alkaline mordant[5], significant results should be obtainable without difficulty.

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Apparent Reversal of Position of the Golgi Element in the Renal Tubule

THE work of Goormaghtigh[1] in elaborating on and extending Ruyter's discovery[2] of specialized cells in the renal arteriole, when taken along with Zimmerman's description[3] of an aggregation of the cells in the adjacent distal tubule, which Zimmerman called the *macula densa*, has introduced new terms and concepts into the histology and pathology of the kidney. It has already been shown that the tubule and the glomerulus which are in such intimate contact at the glomerular root are parts of the one nephron, and that both structures—the arteriole and tubule—seem similarly affected in disease[4]. Because of these facts and since Goormaghtigh has described both tubule and vessels as being jointly affected in several experimental procedures, we had suggested the term *juxta-glomerular complex* to serve as an all-inclusive term for these structures forming the glomerular root.

Apart from the aggregation of nuclei, distinctive features have been lacking for the cells comprising the *macula densa*. Goormaghtigh[1] described the centrosome in the *macula densa* as being situated on the side of the nucleus towards the attached pole of the cell, but other features to suggest a special function have not been described. Studies were undertaken with various techniques for the Golgi element in an attempt to supply this deficiency.

Kittens were killed rapidly with ether, and kidney blocks were prepared by the Da Fano and Mann-Kopsch (Weigl) techniques. In addition, rabbits were killed, each by a single blow on the head, and blocks of kidney tissue were prepared by the Aoyama, Champy post-osmified (Kolatchev) and Mann-Kopsch (Weigl) techniques. In every instance, the osmium preparations were of little use, whereas the silver impregnations (Da Fano and Aoyama) were quite satisfactory. It was found that toning of the sections for five or ten minutes in gold chloride (0·1 per cent containing a few drops of glacial acetic acid per 100 c.c.) appeared to increase the clarity of the images of the Golgi structures.

The appearances of the Golgi structures in the cat and rabbit kidneys are essentially similar. Without enlarging further on the appearance of these structures in the various segments of the renal tubule, suffice it to say that they were seen as granules and short rods. Their position in most tubule cells is remarkably constant, almost invariably being immediately on the lumen side of the nucleus. In the distal tubule a similar position is found except in the cells of the *macula densa*, where the position in respect to the nucleus seems to be reversed and the Golgi element appears to lie on the side of the nucleus towards the attached pole of the cell.

One will not attempt to infer any significance from this apparent reversal of the Golgi element. It may be suggested that if any autonomy existed in the blood supply of the mammalian nephron, the strategic situation for such an effect to be put into action seems to be the juxta-glomerular complex. This autonomy might consist of the regulation of the intermittency of glomerular flow, if such exists, or alteration in the pressure in and about the tubules, or in the afferent and efferent arterioles.

Further studies are in progress on the Golgi element in the kidneys of various other species and will be reported later in detail. It is felt that the cytological aspects of normal and abnormal physiology have been neglected, and that cytological techniques might add something to our information about the normal and diseased human kidney, among other organs.

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Competition for Nitrogen between the Take-all Fungus and the Roots of Crop Plants

SURVIVAL of the take-all fungus (*Ophiobolus graminis*) in buried infected cereal stubble is prolonged by an adequate supply of soluble nitrogen from the surrounding soil[1,2]. If the soil is left in clean fallow after harvesting a cereal crop affected by the take-all disease, then the ammonia and nitrate nitrogen set free by the activities of soil micro-organisms will become available to *O. graminis* in the buried infected cereal stubble, and the survival of the fungus is likely to be prolonged. But in soil under crop, much of the nitrogen thus set free will probably be taken up by the plant roots before it can reach *O. graminis*. With this possibility in mind, I have recently compared the survival of *O. graminis* in lots of 250 lengths each 1½ in. long of infected wheat straw buried in fallow soil, and in soil under trefoil, mustard, and oats, respectively. Eight weeks after burial of the infected straws in the soil, the percentage of straws containing viable mycelium of *O. graminis* (as revealed by a wheat seedling test[1]) was 68 under fallow, 18 under trefoil, 17 under mustard and 4 under oats.

Although due allowance must be made for the fact that this experiment was carried out in boxes