14.00 h for 2 successive days. The other experimental group was injected i.p. with 500 ml urine-equivalent GIS at 14.00 h for 2 successive days. The control group received only the vehicle. The animals were decapitated 24 h after the final injection. 1 µCi of 4-^{14}C-pregnenolone or 1.6 µCi (2.5 µg) of 7α-^{3}H-cholesterol (sp. act.; 500 mCi/mmole, The Radiochemical Centre) with 1.25 µg of cold cholesterol was incubated with 100 mg of the teased tissues of the testes, prepared as described above, at 37 °C for 20 min under an atmosphere of 95% O_2 and 5% CO_2. The incubation medium (the final volume: 3.0 ml) buffered at pH 7.4 with 0.05 M phosphate buffer contained NADPH and nicotinamide (500 µg, each).

The incubation in the in vitro and in vivo experiments was terminated by adding dichloromethane. The extraction of the products was carried out by Sato et al.[17]. A suitable aliquot of the extract was chromatographed on a thin layer of silica gel according to Ota et al.[18], and the radioactive spots were detected by an autoradiographic method[17]. To identify the spots, oxidation and acetylation procedures were used[17]. Radioactivity in the spots which were scraped from the thin layer plate was measured by a liquid scintillation counter.

Results and discussion. Figure 1 shows the relative radioactivity in percent of the products of 4-^{14}C-pregnenolone by the teased tissues of rat testes with and without GIS. More residual pregnenolone was recovered from the media after the incubation with GIS than from the control media without GIS. The addition of GIS to the incubation medium resulted in a decreased formation of androstenedione. Figure 2 shows the relative radioactivity in percent of the products when 4-^{14}C-pregnenolone was incubated with the testicular teased tissues of rats treated with GIS or melatonin. The residual substrate was higher in both of the treated groups than in the control. The lowest production of androstenedione and testosterone was observed in the melatonin-treated group, followed by the GIS-treated group. The formation of products other than androstenedione and testosterone was higher in the melatonin-treated group than the other 2 groups. Figure 3 shows the effects in vivo of GIS and melatonin on the formation of testosterone and androstenedione from 7α-^{3}H-cholesterol by teased tissues of rat testes. A large amount of the unchanged substrate was recovered from the incubation media with the teased testicular tissues of the GIS-treated rats. The conversion of cholesterol into androstenedione, testosterone and other steroids was inhibited by the treatment of GIS. In the production of androstenedione and testosterone, no difference was observed between the control and the melatonin-treated groups.

The present in vitro study indicates that GIS has a direct effect on the steroidogenesis at the level of the testis. The previous study[19] revealed that GIS inhibits exogenous LH, and also exerts an effect at the hypothalamic-pituitary level to prevent LH release in mice. It may be referred from the previous[19] and present studies that GIS also has an indirect effect on the steroidogenesis, possibly through the hypothalamic-pituitary axis, which melatonin does not seem to have.

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Distribution of calcitonin cells in the thyroid glands of normal adult rhesus monkey *Macaca mulatta*

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Summary. The calcitonin cells of adult rhesus monkey *Macaca mulatta* are located in the central region of thyroid along the median axis. The anterior and posterior poles, the isthmus and peripheral regions of thyroid are completely devoid of C cells. The parathyroid also lacks C cells.

The calcitonin (C) cells have been ascribed as the site for the synthesis, storage and release of hypocalcemic, polypeptide hormone-calcitonin in a number of vertebrate species[1-4]. Several reports have been published on the morphology and distribution of these cells from the thyroid of a number of mammalian species, but there are only few reports about the C cells in primates (mostly in man)[5-10]. Since monkeys have been considered to be the best substitutes for human studies of calcium metabolism[11], we have chosen Indian rhesus monkey, *Macaca mulatta*, to study the morphology and distribution of C cells.

The thyro-parathyroid complex from 6 adult monkeys was dissected out under ether anaesthesia and fixed in Bouin and GPA mixture[12]. Serial sections of entire glands were cut at 4–6 µm and stained with haematoxylin-eosin, lead haematoxylin[12] and Davenport's silver impregnation[13].

Histologically the monkey thyroid gland consists of follicles which have a layer of follicular epithelial cells surrounding a colloid-containing lumen. Within the basement membrane of follicles, the C cells occur singly or in groups of 2 or 3. Sometimes they are also seen in the lumen (figure 1). The cells are perceivably larger than those of follicular cells

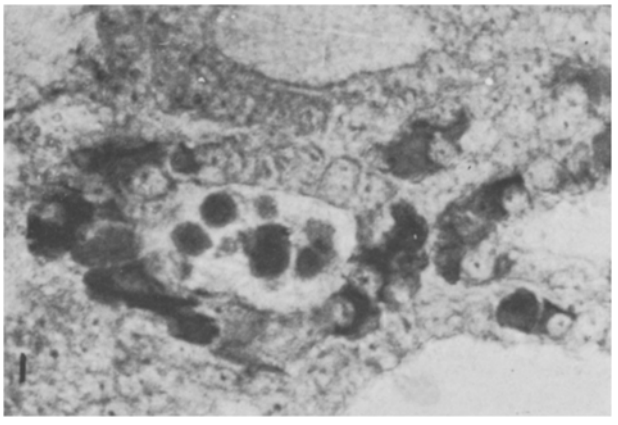

Fig. 1. Calcitonin cells in the monkey thyroid gland stained dark with lead haematoxylin. × 450.

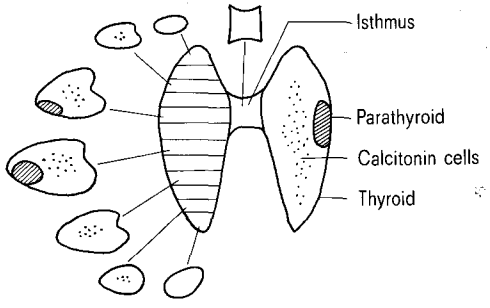

Fig. 2. Diagrammatic representation of the distribution of calcitonin cells in the thyroid of adult monkey.

(C cells range from 10.5 µm to 15.0 µm and their nuclei from 6.5 µm to 8.5 µm, whereas the follicular cells and their nuclei range from 6.5 µm to 8.5 µm and from 5.0 µm to 7.5 µm respectively). The C cells are intraepithelial, parafollicular and interfollicular in position (figure 1). They are located in the central region of the thyroid along the median axis. The anterior and posterior poles, the isthmus and peripherial regions of thyroid are completely devoid of C cells. The parathyroid also lacks C cells (figure 2). When stained with haematoxylin-eosin, the C cells take lighter stain. With lead haematoxylin and Davenport's silver impregnation[13], the C cells are selectively stained. In the former, the secretory granules of C cells take a deep blue-black stain (figure 1), whereas in latter the C cells demonstrated argyrophilic intracytoplasmic granules (figure 2).
Pilgrim[5] observed the C cells mainly in dorsomedial part of the thyroid of horse, monkey and man. Their total absence

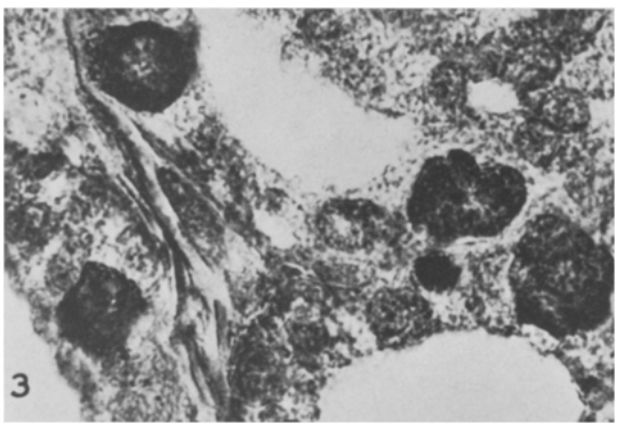

Fig. 3. Calcitonin cells in the monkey thyroid gland stained by silver impregnation. × 1000.

from the regions mentioned above (in monkey) has been reported from human thyroid[7,8]. Wolfe et al.[9] have, however, reported a meagre percentage of C cells from polar and isthmus regions of adult human thyroid, whereas in human neonates[10] the C cells were concentrated in a zone in the upper $^2/_3$ of the lateral lobes bilaterally, and were present in small groups in both intrafollicular and parafollicular positions. The interfollicular, intrafollicular and the parafollicular positions of C cells in monkey are similar to those of human adult[9].
On the basis of studies reported here, we conclude that C cells in Indian rhesus monkey show more or less a similar pattern of distribution as in human thyroid.

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Action potentials in non-tumor cells from the anterior pituitary gland

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Summary. Non-tumor cells of rat anterior pituitary gland are able, upon electrical stimulation, to generate action potentials which are based on an increase of the membrane permeability to both Na^+ and Ca^{2+}.

Action potentials have recently been recorded in several endocrine cells and their neoplastic derivatives[2-6]. Concerning the anterior pituitary, Kidokoro[7] has demonstrated that the clonal cell line GH_3 of a rat anterior pituitary tumor generates Ca-dependent action potentials. Biales et al.[8] have also shown that cultured cells of anterior pituitary tumors, including the GH_3 line, generate action potentials. The action potentials produced in the GH_3 cells were in this case dependent upon both Na^+ and Ca^{2+}. 2 main questions arise from these reports on neoplastic tumor cells: are non-