

an increase produced by thyroxine accelerates their onset.

*Summary.* Long-term administration of thyroxine to adult rats at a level that produced a 50% increase in O<sub>2</sub> consumption, increased the severity of spontaneous nephrosis and proteinuria. The amount of excreted protein corresponded roughly with severity of renal lesions. The electrophoretic pattern of the urinary proteins of untreated or treated rats resembled that of the serum proteins. Hyperglobulinemia was present in both untreated and treated rats, but to a lesser degree in 600-day-old thyroxine-treated animals with greatest proteinuria and elevated BUN values. In the latter rats serum albumin was reduced too. Hypercholesterolemia was greater in treated rats than in untreated ones. Kidney, heart, and adrenal weights were also higher in animals receiving thyroxine, whereas body weight was lower.

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## Effect of Advancing Age on Thyroid Hormone Secretion Rate of Female Rats.\* (30737)

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Evidence that the thyroid undergoes atrophic and degenerative changes in old age both in animals(1,2,3,4), and man(5,6) has been reported. Thyroid function has been reported to be depressed with advancing age in mice (7), rats(8,9), chickens(10,11,12,13), turkeys(14), guinea pigs(15), rabbits(16), dogs (17), cattle(18,19), raccoon(20) and opossum(21). The present investigations were undertaken to study the effect of age on the thyroid hormone secretion rate (TSR) of female rats from weaning time until they were about 4 months of age, at 30-day intervals

since no data was available on the TSR of the female rats of increasing age up to sexual maturity.

*Materials and methods.* The TSR estimation of 27 female rats of the Sprague-Dawley-Rolfsmeyer strain, bred in this laboratory and maintained at a temperature of  $78 \pm 1^\circ\text{F}$ , was started when they were 25 days of age and had an average body weight of 55 g, by the technique described by Grosvenor and Turner(22). The TSR of the same rats was estimated at 30-day intervals starting at the ages of 55, 85 and 115 days respectively. During these investigations the rats had free access to water and Purina Lab Chow.

*Results.* The mean TSR of the 27 surviving rats as determined at the ages of 25, 55,

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TABLE I. Effect of Age on TSR in Female Rats.

Age (days)	Mean body wt (g)	Mean TSR/100 g bw ( $\mu\text{g L-T}_4$ )	Reduction in TSR from previous month (%)
25	58	1.52	
55	166	1.22	19.7
85	203	1.10	9.8
115	223	.88	20
Total			42.1

85 and 115 days were respectively 1.52  $\mu\text{g L-T}_4/100$  g bw, 1.22  $\mu\text{g L-T}_4/100$  g bw, 1.10  $\mu\text{g L-T}_4/100$  g bw, and 0.88  $\mu\text{g L-T}_4/100$  g bw, thus showing a gradual reduction in TSR of 19.7% at 55 days, 9.8% at 85 days and 20% at 115 days from that of the respective previous month. The total reduction during the period of active growth from 25 days to 115 days was 42.1%.

*Discussion.* Numerous reports in the literature indicate that thyroid function is depressed with advancing age but none of them quantitatively relate the TSR of the immature growing rats during the period of active growth from weaning time. Monroe and Turner(8) reported a reduction in TSR as determined by the goitrogen technique, of different weight groups rather than the same rats at different ages, as is being reported now. Grad and Hoffman(9) observed a reduction in TSR of rats with advancing age, but their studies involved a comparison of TSR of young rats (4½ months of age) with that of old animals (29 months of age). The present investigation, however, reveals that the TSR of female rats starts declining much before they reach the age of 4½ months and a marked reduction in TSR per 100 g bw (42.1%) occurs from weaning time until about 4 months of age. The results are in full agreement with those of Tanabe(13) that in chickens the TSR on the basis of per unit body weight is maximum at 2 weeks of age, Maqsood(16) that TSR is reduced in rabbits from 4 weeks of age to 48 weeks of age, Bauman and Turner(21) that TSR of the adult opossum is less than that of juveniles, and of Bauman *et al*(20) that TSR of the raccoon is reduced from juvenile to adulthood. Gregerman(23) studied the effect of

age on TSR of rats, by a radioactive thyroxine turnover rate technique. He observed a higher TSR in a group of rats 24 months of age ( $1.63 \pm .12 \mu\text{g}/100$  g/day) than either a group of 12 months old ( $1.20 \pm .10 \mu\text{g}/100$  g/day) or a group 3½ months old ( $1.20 \pm 0.09 \mu\text{g}/100$  g/day). The mean TSR of the 3½-month-old group of rats is essentially the same as estimated by the technique developed in this laboratory and used during the present investigation. The TSR as estimated by the goitre prevention assay and by the radioiodine technique has further been shown to be similar(24). The explanation given by Gregerman(23), questioning the validity of the earlier results determined by the goitre prevention assay(8,9) is, therefore not clear, because the same technique has been used for estimation of TSR at various ages. It is possible that the high TSR of the 2-year-old rats may be due to the undoubted selectivity of this group. It is quite possible that rats which survive to the age of 2 years may be in the upper frequency distribution in regard to TSR. In other words, may not rats with higher TSR tend to live to more advanced age? Only by the study of the same rats of increasing age can this problem be solved.

*Summary.* The TSR of 27 female rats was estimated at the ages of 25, 55, 85 and 115 days. A marked reduction (42.1%) from a TSR of 1.52  $\mu\text{g L-T}_4/100$  g bw when started at the age of 25 days to 0.88  $\mu\text{g L-T}_4/100$  g bw when started at the age of 115 days was observed. The reduction in TSR at 55, 85 and 115 days age was respectively 19.7%, 9.8% and 20% from that of the previous month.

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### Use of Human Diploid Cell Cultures for Primary Isolation of Respiratory Syncytial Virus.\* (30738)

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Studies of children and adults with acute respiratory infections have shown that several families of viruses, including the Parainfluenza viruses, Respiratory Syncytial (R.S.) virus and the Rhinoviruses play important roles in the etiology of such illnesses. In working with these viruses, it has been the experience that no single cell culture system can be considered optimum for isolation and propagation of all of these agents. Thus, the cell culture systems considered best for primary isolation of the Parainfluenza viruses are those derived from the kidneys of Old World monkeys, those for the Rhinoviruses, human embryo kidney, or human fetal diploid cells, and those for R. S. virus, continuous lines derived from human carcinoma tissues, particularly HEp-2.

Studies of children with acute respiratory illnesses have been conducted in this laboratory, in which specimens from patients were inoculated into cultures of Rhesus monkey

kidney cells, human fetal diploid cells, and HEp-2 cells. In the course of this work it appeared that primary isolation of R. S. virus could be accomplished as well with the human fetal diploid cells, as with HEp-2 cells. The following report presents detailed comparisons of R. S. virus isolation rates and infectivity titers observed when specimens from patients were inoculated in both HEp-2 and human fetal diploid cell cultures. The results of these comparisons suggest that human fetal diploid cell strains may be considered appropriate for the primary isolation of R. S. virus.

*Materials and methods. Cells.* Strain WI-38: diploid cell derived from human embryonic lung, female(1). Strain Hel-1: human embryonic lung from a 14-week-old embryo—University of Chicago. This diploid cell was established according to the method of Hayflick(1). HEp-2: human epidermoid carcinoma, larynx(2).

*Media and solutions. Growth:* Eagle's Minimum Essential Medium (MEM), supplemented with 10% calf, plus 5% fetal calf

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