

**RADIATION INDUCED ABNORMALITIES  
IN THE CHICK EMBRYONIC DEVELOPMENTS**

**THESIS**

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## A B S T R A C T

The chick embryo was chosen for the presented investigation as it offers a number of advantages which enhance its application to gamma irradiation experiments.

Percentage lethality of Gallus domesticus and white Leghorn chick embryos were examined at the end of the incubation period. Among the ten irradiation doses practised, the LD<sub>50</sub>(21) for Gallus domesticus was 650 r., while the LD<sub>50</sub>(21) for white Leghorn was 780 r. This ~~invoked~~ <sup>evoked</sup> difference suggests that radiosensitivity may be influenced by the specie.

Irradiation at the sub-lethal range induced retardation of embryonic development, the magnitude of which was proportional to the dose. This was also associated with various anomalies.

At the end of incubation, hatchability was severely inhibited at all tested radiation levels. Hatching chicks exhibited an assortment of malformations including feathers, sense organs, beaks, wings, limbs and digits. The mechanism of abnormal differentiation is explained on the basis of experimental evidence stressing the role of R.N.A. in morphogenesis.

The livers of hatching chicks displayed a dose dependant increase in weight. Gross changes were characterized by the development of dark depressed areas on a pale yellowish back ground.

The histopathologic feature of the livers of chicks exposed to 260 r. was represented by degenerative parenchymal cells. At 390 rads, radiation induced damage progressed to generalized necrosis and fibrosis, characterized by having no regular pattern.

Hepatic tumours were produced in chicks exposed to 520 r. The main form was of the infiltrative type, invading tissues, with their consequent replacement by tumour cells. Not infrequently, however, expansive tumours were evident. The chief structural feature of tumours of both types was their abnormal arrangement of tissue elements in relation to the surrounding tissues, their abnormal structure and intensive staining of cellular elements.

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