Observations
General Observations:

Radiation sickness and mortality:

There was no discernible sign and symptoms of radiation sickness in Swiss albino mice administered 1.0 and 2.0 μCi/g body weight of radiocalcium (Ca$^{45}$). In Indian desert gerbil (Meriones hurrianae, Jerdon) given 1.0 μCi/g body weight of Ca$^{45}$ symptoms of sluggishness during early intervals following radioisotope administration were observed. Their response to external stimuli was also very poor. However, Indian desert gerbils administered 2.0 μCi/g body weight of Ca$^{45}$ displayed...
of radiation sickness in the form of diarrhoea, anorexia, debility and lassitude, 3 days onwards.

There was no mortality in Swiss albino mice administered 1.0 and 2.0 \( \mu \text{Ci/g} \) body weight of \( \text{Ca}^{45} \) and Indian desert gerbils (Meriones hurrianae, Jerdon) injected with 1.0 \( \mu \text{Ci/g} \) body weight of \( \text{Ca}^{45} \). However, gerbils injected with 2.0 \( \mu \text{Ci/g} \) body weight of \( \text{Ca}^{45} \) showed mortality. First mortality was observed on 7 day posttreatment. Maximum mortality was observed between 9th and 18th day after \( \text{Ca}^{45} \) injection. No gerbil could survive at 28 days posttreatment (Table I).

Normal histology:

The mammalian liver is the largest gland of the body. Relatively speaking, it has a simple structure but a very diversified complex physiology. It is this aspect which has been responsible for the disparity of many investigators who attempted to correlate the histopathological changes with the functional disorder of the organ.

(i) Swiss albino mice:

The liver of Swiss albino mice is a large, dark reddish gland consisting of 5 lobes, the right central, right lateral, left central, left lateral and small spigellian lobe. The gall bladder is present.
The hepatic parenchyma shows lobular organization, the lobules being incompletely separated from each other by connective tissue septa. The septa are visible only around interlobular branches of the hepatic artery and portal vein. Each lobule is made up of a large number of polyhedral hepatic cells with prominent central nucleus and one or more nucleoli. Whereas uninucleate condition is the rule, binucleate cells are also present (9.5 ± 0.75 per cent). The cell outline is often indistinct and the cytoplasm granular. The hepatocytes in a lobule are arranged in a one cell thick longitudinal hepatic cords around the central vein. They are separated from each other by blood sinusoids which communicate between interlobular blood vessels and the central vein. The lining of the sinusoids is endothelium containing specialized phagocytic cells, the Kupffer cells (36.2 ± 3.14/mm²) (Fig. 1).

(ii) Indian desert gerbil (Meriones hurrianae, Jerdon): The liver of Indian desert gerbil (Meriones hurrianae, Jerdon) like that of Swiss albino mice liver consists of 5 lobes. The gall bladder is absent in gerbil. Histologically, there is no variation in the structure of liver of gerbil as compared to Swiss albino mice (Fig. 2).
Histopathological and Histometric Observations:

(a) **Swiss albino mice:**

(i) **Experiment 1:** Swiss albino mice were injected with 1.0 μCi/g body weight of radiocalcium (Ca⁴⁵). The histopathological and histometric alterations produced are described as follows:

1 **Day posttreatment:**

Liver shows no marked histopathological lesions except for mild oedema and degranulation of the cytoplasm. In few cells the nuclei are dislocated and some cells even do not have any nucleus (enucleated cells) (10.5 ± 0.77 per cent). A few pyknotic nuclei (2.0 ± 0.167 per cent) are also seen. The number of binucleated cells is lower than that of normal liver (6.75 ± 0.155 per cent). The Kupffer cells show hypertrophy and their number is increased (41.0 ± 3.075 cells/mm²). Some lymphocytic infiltration is visible (Fig. 2, Table II, III).

3 **Days posttreatment:**

Liver cells show higher degree of oedema. Nuclei in many cells have either been knocked off (21.6 ± 1.40 per cent) or are eccentric. There are many pyknotic nuclei (9.5 ± 1.375 per cent). The hepatocyttoplasm shows further degranulation
and vacuolation. The number of binucleated cells increases (11.0 ± 0.825 per cent). The number of Kupffer cells increases further (49.8 ± 3.3725 /mm²) and these cells are hypertrophied. Lymphocytic infiltration and some foci of hyperaemia are visible (Fig. 1, Table II, III).

5 Days posttreatment:
Liver cells still show damage although the damage is less than that observed at 3 days posttreatment. There are some cells which show reparative tendencies in the form of granulation of cytoplasm. The number of pyknotic and enucleated cells decreases (5.50 ± 0.165 per cent and 13.16 ± 0.90 per cent respectively). The number of binucleated cells increases further (21.6 ± 1.99 per cent). The number of Kupffer cells decreases (45.2 ± 4.595 /mm²) but the number remains above control level. Lymphocytic infiltration and hyperaemia still visible (Fig. 6, Table II, III).

7 Days posttreatment:
Liver cells show reparative tendencies. Granulation of cytoplasm is apparent. The number of enucleated cells declines further (9.83 ± 2.374 per cent) with no pyknotic cell nuclei. Nuclei become normal though some enlarged nuclei are still seen. The number of binucleated cells
decreases (12.5 ± 2.07 per cent). Few multinucleated cells are also observed at this stage (2.5 ± 0.285 per cent). The number of Kupffer cells show further decrease (38.0 ± 3.24 /mm²) and they become normal. Lymphocytic infiltration and hyperaemia not seen (Fig. 8,10 , Table II, III).

14 Days posttreatment:
Liver at this stage show almost complete recovery. The cytoplasm is granular and the nuclei are normal in structure. The number of enucleated cells decreases. Only a few enucleated cells are seen at this stage (0.60 ± 0.08 per cent). The number of binucleated cells is equal to that observed in normal control mice (9.0 ± 0.363 per cent). However, some multinucleated cells are still seen (1.5 ± 0.10 per cent). The number of Kupffer cells is near control values (35.6 ± 3.372 /mm²). Lymphocytic infiltration and hyperaemia not observed (Fig. II, 37, Table II, III).

28 Days posttreatment:
Liver at this stage shows relapse of damage. Liver cells show oedema, degranulation and vacuolation of cytoplasm. Nuclei in some cells are dislocated (eccentric) and many cells even do not have any nucleus (14.8 ± 2.2 per cent). The number of binucleated cells increases (11.5 ± 0.87 per cent)
and the number of multinucleated cells is also increased 
(6.5 ± 0.155 per cent). The number of Kupffer cells shows 
an increase (41.4 ± 4.025 /mm²) and they are hypertrophied. 
Lymphocytic infiltration and hyperaemia visible (Fig. 15, 37, 38, 
Table II, III).

165 Days posttreatment:
The hepatocytoplasm is eosinophilic. A few enucleated cells 
are seen (1.5 ± 0.5 per cent). The number of binucleated 
cells is lowerer than that observed in control mice (5.5 ± 
0.5 per cent). The nuclei are hyperchromatic with clumped 
chromatin. Many large vesicular nuclei with prominent 
nucleoli are seen. The number of Kupffer cells also decreases 
(22.4 ± 2.378 /mm²). Lymphocytic infiltration and hyperaemia 
not seen (Fig. 17, 18, Table II, III).

(ii) Experiment 2: Swiss albino mice were given radiocalcium 
(Ca⁴⁵) at the dose level of 2.0 μCi/g body weight. 
Histopathological and histometric changes produced are as 
follows:

1 Day posttreatment:
Liver cells look oedematous. Degranulation and vacuolation 
of cytoplasm is seen. In few cells the nuclei are completely 
knocked off and the oedematous cells are left with bare
outline only (17.0 ± 1.0118 per cent). Some cells have pyknotic nuclei (4.5 ± 0.6451 per cent). The number of binucleated cells decreases (5.5 ± 0.6122 per cent). The Kupffer cells are hypertrophied and their number is slightly increased (45.2 ± 2.2226 /mm²). Some foci show lymphocytic infiltration (Fig. 3, Table II, III).

3 Days posttreatment:
Liver cells exhibit higher degree of oedema, degranulation and vacuolation of the cytoplasm. Many nuclei appear pyknotic (13.6 ± 0.5565 per cent). In some cells, the nuclei are dislocated and many enucleated cells are also visible (27.0 ± 1.1169 per cent). The number of binucleated cells increases (16.5 ± 2.1 per cent). The number of Kupffer cells increases further (54.5 ± 4.755 /mm²) and show hypertrophy. Lymphocytic infiltration and hyperaemia visible (Fig. 5, Table II, III).

5 Days posttreatment:
Degranulation and vacuolation of cytoplasm still visible. However, the number of pyknotic nuclei (7.5 ± 0.8336 per cent) and enucleated cells (19.0 ± 2.2258 per cent) show a decrease. The number of binucleated cells increases further (27.6 ± 1.070 per cent). The number of Kupffer cells shows a decline (50.6 ± 3.797 /mm²) but the number still remains above the
control values. Lymphocytic infiltration and hyperaemia visible though to a lesser extent (Fig. 7, 37, 38, Table II, III).

7 Days posttreatment:
A trend towards normalization is observed at this stage. Granulation of cytoplasm is apparent but few cells still show degranulation and vacuolation of cytoplasm. Few enucleated cells (13.50 ± 3.24 per cent) are also seen. The number of binucleated cells shows a decrease (15.8 ± 2.2360 per cent) but some multinucleated cells having 3-6 nuclei are seen at this stage (5.6 ± 1.4610 per cent). The number of Kupffer cells shows a decline (43.8 ± 4.8975 /mm²). A few foci show some lymphocytic infiltration but no hyperaemia (Fig. 9, 37, 38, Table II, III).

14 Days posttreatment:
Normal structure of liver is observed at this stage. The hepatic cells and nuclei appear normal. The cytoplasm becomes granular with no vacuolisation. Very few enucleated cells are seen (2.2 ± 0.4062 per cent). The number of binucleated cells is near equal to the number observed in control mice (9.5 ± 0.8336 per cent). Few multinucleated cells are seen (4.2 ± 0.778 per cent). The number of Kupffer cells becomes near control (36.5 ± 4.595 /mm²). Lymphocytic infiltration
and hyperaemia not seen (Fig. 12, 13, Table II, III).

28 Days posttreatment:

Liver at this stage shows relapse of damage in the form of oedematous cells, degranulation and vacuolation of cytoplasm. In few cells the nuclei are dislocated and some cells are without any nucleus (19.5 ± 2.344 per cent). Few cells with pyknotic nuclei (3.5 ± 0.6779 per cent) are also seen. The number of binucleated cells increases (15.5 ± 1.5925 per cent) and also the number of multinucleated cells increases (10.0 ± 1.070 per cent). The number of Kupffer cells shows an increase (43.6 ± 4.5 /mm²) and they are hypertrophied. Lymphocytic infiltration and hyperaemia is seen at some places (Fig. 16, Table II, III).

165 Days posttreatment:

The cytoplasm is eosinophilic. In few cells the nuclei are completely knocked off and the cells are left with bare outline (3.25 ± 0.89 per cent). A decrease in the number of binucleated cells is observed as compared to control mice (3.5 ± 0.187 per cent). Some nuclei with hyperchromatic and clumped chromatin are present. Many large, vesicular nuclei with prominent nucleoli are also present. The number of Kupffer cells shows a decrease than control mice (19.8 ±
Lymphocytic infiltration and hyperaemia not visible (Fig. 13.20, Table II, III).

(b) *Indian desert gerbil* (*Meriones hurrianae*, Jerdon)

**Experiment 1:** Indian desert gerbil (*Meriones hurrianae*, Jerdon) were injected with 1.0 μCi/g body weight of radiocalcium Ca\(^{45}\). The histopathological and histometric alterations produced in the liver are described as follows:

**1 Day posttreatment:**
Liver cells show slight oedema and the cytoplasm shows degranulation and vacuolation. In few cells the nuclei are eccentrically placed and some cells are enucleated (8.0 ± 0.8916 per cent). A few pyknotic nuclei (2.25 ± 0.155 per cent) are also seen. The number of binucleated cells shows a decline (11.0 ± 2.344 per cent). The Kupffer cells show hypertrophy and their number increases (43.2 ± 3.7975 /mm\(^2\)). In some areas, lymphocytic infiltration is seen (Fig. 3.3.4b, Table IV, V).

**3 Days posttreatment:**
Liver cells exhibit higher degree of oedema, degranulation and vacuolation of cytoplasm. Many nuclei appear pyknotic (12.5 ± 0.9822 per cent) and bizzarre and in some cells the nuclei are
dislocated. In many cells the nuclei are completely knocked off and the oedematous cells are left with bare outline (enucleated cells) (19.5 ± 2.1428 per cent). The number of binucleated cells shows an increase (16.0 ± 1.1169 per cent). The number of Kupffer cells also increases (49.8 ± 2.73 /mm²) and they are hypertrophied. Lymphocytic infiltration and hyperaemia are visible (Fig. 23 , Table IV, V).

5 Days posttreatment:
Degranulation and vacuolation of cytoplasm still visible. However, the number of pyknotic nuclei (3.5 ± 0.6122 per cent) and number of enucleated cells (13.5 ± 1.056 per cent) decreases. The number of binucleated cells shows further increase (26.0 ± 4.025 per cent), and few multinucleated cells are also seen (1.5 ± 0.155 per cent). The number of Kupffer cells declines (46.0 ± 6.74 /mm²) but they still show hypertrophy. Lymphocytic infiltration and hyperaemia still visible (Fig. 25 , Table IV, V).

7 Days posttreatment:
A trend towards normalization is observed at this stage. However, some cells still show degranulation and vacuolation of cytoplasm. The number of enucleated cells shows further decline (4.5 ± 0.8746 per cent). The number of binucleated
cells decreases (18.5 ± 2.07 per cent) but that of multinucleated cells increases further (9.6 ± 2.17 per cent). The number of Kupffer cells shows further decrease (41.2 ± 4.5 /mm²) but their number is still above normal values. Lymphocytic infiltration and hyperaemia rarely seen (Fig. 39, 40, Table 14, 15).

14 Days posttreatment:

Liver cells show further repair tendencies. The cytoplasm becomes granular and vacuolisation is not seen. The number of enucleated cells is very less (0.5 ± 0.19 per cent). The number of binucleated cells shows further decrease and their number is lower than that of control values (8.5 ± 0.50 per cent). However, the number of multinucleated cells increases further (17.5 ± 2.5 per cent). The number of Kupffer cells reaches near control values (39.5 ± 4.8 /mm²) and they appear normal. Lymphocytic infiltration and hyperaemia not seen (Fig. 29, 30, Table 14, 15).

28 Days posttreatment:

Normal structure of liver is observed at this stage. The hepatic parenchyma and nuclei appear normal. The cytoplasm is granular. The number of binucleated cells reaches the control values (13.75 ± 1.5 per cent) and few multinucleated
cells are seen (1.5 ± 0.5 per cent). The number of Kupffer cells reaches control value (40.0 ± 2.8 /mm²). Lymphocytic infiltration and hyperaemia not seen (Fig.3, 35, 36 Table IV, V).

Experiment 2: - Indian desert gerbils (Meriones hurrianae, Jerdon) were administered radiocalcium (Ca⁴⁵) at the dose level of 2.0 μCi/g body weight intraperitoneally. Various histopathological and histometric alterations produced in the liver are described below:

1 Day posttreatment:
Liver cells look oedematous. The cytoplasm shows degranulation and vacuolation. In some cells the nuclei are dislocated and eccentrically placed and few cells even do not have nucleus (13.0 ± 1.2 per cent). Few pyknotic nuclei are also seen (5.25 ± 0.80 per cent). The number of binucleated cells declines (8.5 ± 0.7 per cent). The number of Kupffer cells increases (46.5 ± 2.344 /mm²) and they show hypertrophy. Lymphocytic infiltration is seen at some places (Fig.2, 3, 35, 40, Table IV, V).

3 Days posttreatment:
Liver shows further damage in the form of higher degree of oedema, degranulation and vacuolation of cytoplasm. In few
cells, the nuclei are dislocated and many enucleated cells are observed (29.8 ± 2.2360 per cent). Many nuclei appear pyknotic (23.5 ± 4.755 per cent). The number of binucleated cells shows an increase (22.8 ± 4.025 per cent). The Kupffer cells show hypertrophy and their number increases further (55.8 ± 4.635 /mm²). Lymphocytic infiltration and hyperaemia are observed (Fig. 24, Table IV, V).

5 Days posttreatment:
Liver cells still show oedema. The cytoplasm is degranulated and vacuolated. The number of enucleated cells (21.7 ± 1.5925 per cent) and pyknotic nuclei (7.5 ± 0.6451 per cent) decreases than that observed at 3 days posttreatment. The number of binucleated cells increases further (32.6 ± 3.14 per cent). Few multinucleated cells are also seen (5.5 ± 0.6873 per cent). The number of Kupffer cells show further increase (59.2 ± 6.4 /mm²). Lymphocytic infiltration and hyperaemia seen at several places (Fig. 26, Table IV, V).

7 Days posttreatment:
The hepatic cells still show oedema. Degranulation and vacuolation of cytoplasm is still visible. However, in a few cells some reparative tendencies are seen in the form of granulation of cytoplasm. Only a few enucleated cells (6.5 ±
0.3201 per cent) and some pyknotic nuclei (2.2 ± 0.2371 per cent) are seen at this stage. The number of binucleated cells shows a decline (21.5 ± 2.344 per cent) but that of multinucleated cells shows further increase (21.5 ± 4.2 per cent). The number of kupffer cells shows a decline (49.7 ± 4.755 /mm²) but they are still hypertrophied. Lymphocytic infiltration and hyperaemia are seen at some places (Fig. 27, Table IV, V).

14 Days posttreatment:
Liver cells still exhibit slight oedema. However, granulation of cytoplasm is apparent at this stage. Pyknotic nuclei and enucleated cells are not seen. The number of binucleated cells decreases further yet the number is above control values (16.5 ± 0.7382 per cent). The number of multinucleated cells increases further (24.5 ± 2.2360 per cent). The number of kupffer cells shows further decrease yet this value is significantly above control values (42.0 ± 4.635 /mm²). Lymphocytic infiltration and hyperaemia is seen at some places (Fig. 3c, 33, Table IV, V).

28 Days posttreatment:
No gerbil could survive till this stage after 2.0 µCi/g body weight of Ca⁴⁵.
Biochemical Observations:

Quantitative estimations have been carried out with respect to glycogen, phosphorylase (glycogen degradative), phosphorylase (glycogen synthesis), glucose-6-phosphatase, phosphohexose isomerase, glutamate pyruvate transaminase, glutamate oxalacetate transaminase, acid phosphatase and alkaline phosphatase in Swiss albino mice and Indian desert gerbil (Meriones hurrianae, Jerdon). The results obtained are described as follows:

A. Swiss albino mice

(1) Glycogen (Fig. IV, Table VI)

Control: The glycogen content in the liver of control (unirradiated) Swiss albino mice is \(39.6 \pm 0.6605 \text{ mg/g liver weight}\).

Experimental:

(a) 1.0 \(\mu\)Ci/g body weight of Ca\(^{45}\):

The glycogen concentration per gram of liver in Swiss albino mice injected with Ca\(^{45}\) shows a biphasic response. There is an increase from 1 day onwards reaching maximum value on 5 days posttreatment (55.4 \(\pm\) 0.5975 mg/g liver weight). Thereafter, the glycogen content starts decreasing. The values become
near normal at 14 days posttreatment (39.94 \pm 0.695 \text{ mg/g liver weight}). On 28 days posttreatment, increase in the glycogen content is again observed (43.47 \pm 1.12 \text{ mg/g liver weight}). However, on 165 days posttreatment, a decrease in the glycogen content is observed (33.3 \pm 1.042 \text{ mg/g liver weight}).

(b) 2.0 \mu\text{Ci/g body weight of Ca}^{45}:

The glycogen content in the liver of Swiss albino mice after 2.0 \mu\text{Ci/g body weight of Ca}^{45} depicts biphasic response. The glycogen content increases during early intervals. The maximum values are observed on 5 days posttreatment (59.27 \pm 0.695 \text{ mg/g liver weight}). 7 days after Ca^{45} injection the glycogen content starts decreasing (54.33 \pm 4.07 \text{ mg/g liver weight}) and near control values are observed on 14 days posttreatment (41.45 \pm 1.069 \text{ mg/g liver weight}). On 28 days posttreatment, the glycogen content again increases (49.98 \pm 1.342 \text{ mg/g liver weight}). However, on 165 days posttreatment, significant decrease in the glycogen content is observed (23.09 \pm 0.539 \text{ mg/g liver weight}).

**Phosphorylase (glycogen degradative):** Fig. 412, Table VII

**Control:** The activity of phosphorylase (glycogen degradative) in the liver of control (unirradiated) Swiss albino mice is
307.0606 ± 4.54 mg glucose formed/g liver weight.

Experimental:

(a) 1.0 μCi/g body weight of Ca⁴⁵:

There is a decrease in the activity of the enzyme phosphorylase (glycogen degradative) after 1.0 μCi/g body weight of Ca⁴⁵ injection during early intervals. The enzyme shows minimum values at 5 days posttreatment (164.218 ± 4.03 mg glucose formed/g liver weight). On day 7, the activity starts increasing (186.19 ± 3.462 mg glucose formed/g liver weight) and the values become near normal on day 14 posttreatment (314.5048 ± 13.094 mg glucose formed/g liver weight). Second decrease in the activity of the enzyme is observed on 28 days posttreatment (274.63 ± 7.46 mg glucose formed/g liver weight). The enzymatic activity is below the control value (302.13 ± 12.42 mg glucose formed/g liver weight) on 165 days posttreatment.

(b) 2.0 μCi/g body weight of Ca⁴⁵:

The activity of the enzyme phosphorylase (glycogen degradative) shows a decline during early intervals after Ca⁴⁵ injection. The values are minimum on 5 days posttreatment (142.42 ± 1.6022 mg glucose formed/g liver weight). From 7 days posttreatment, the activity shows an increase and becomes near control values.
on 14 days posttreatment (315.67 ± 1.035 mg glucose formed/g liver weight). The activity of phosphorylase again decreases on 28 days posttreatment (251.97 ± 6.21 mg glucose formed/g liver weight) and remains significantly below control values on 165 days posttreatment (280.50 ± 4.26 mg glucose formed/g liver weight).

**Phosphorylase (glycogen synthesis):** Fig. 43, Table VIII

**Control:** The activity of phosphorylase (glycogen synthesis) in the liver of control (unirradiated) Swiss albino mice is 552.3226 ± 84.63 mm Pi formed/g liver weight.

**Experimental:**

(α) 1.0 μCi/g body weight of Ca⁴⁵:

Following Ca⁴⁵ injection, the activity of phosphorylase (glycogen synthesis) shows an increase. The maximum values are observed on 5 days posttreatment (972.9818 ± 13.64 mm Pi formed/g liver weight). From 7 days posttreatment, the activity of the enzyme declines and becomes near control values on 14 days posttreatment (574.6897 ± 76.30 mm Pi formed/g liver weight). Second increase in the activity of the enzyme is observed on 28 days posttreatment when the value is 135 per cent of the control values (737.1122 ± 87.60 mm Pi formed/g liver weight). However, significant decrease in the
activity of phosphorylase (glycogen synthesis) is observed on 165 days posttreatment (431.017 ± 10.30 mM Pi formed/g liver weight).

(b) 2.0 μCi/g body weight of Ca⁴⁵:

The activity of phosphorylase (glycogen synthesis) after injection of 2.0 μCi/g body weight of Ca⁴⁵ shows an increase during early intervals. Maximum values are observed on 5 days posttreatment (1198.9757 ± 33.33 mM Pi formed/g liver weight). 7 Days after injection of Ca⁴⁵, a decline in the activity of the enzyme is observed (941.75 ± 40.78 mM Pi formed/g liver weight) and the near control values are observed on 14 days posttreatment. On 28 days posttreatment, there is again an increase in the activity of the enzyme (826.5773 ± 156.5 mM Pi formed/g liver weight). The activity of the enzyme, however, shows a significant decrease on 165 days posttreatment (310.1113 ± 47.02 mM Pi formed/g liver weight).

Glucose-6-phosphatase (G-6-Phase): Fig. 14, Table IX

Control: The activity of G-6-Phase in the liver of control (unirradiated) Swiss albino mice is 474.7989 ± 5.18 mM Pi formed/g liver weight.
Experimental:

(a) \(1.0 \, \mu\text{Ci/g body weight of Ca}^{45}\):  
The activity of G-6-Pase in the liver of Swiss albino mice after injection of \(1.0 \, \mu\text{Ci/g body weight of Ca}^{45}\) declines during early intervals. Minimum values are observed on 5 days posttreatment (283.94 ± 13.15 mM Pi formed/g liver weight). On 7 days posttreatment, the activity of the enzyme increases (397.909 ± 46.2 mM Pi formed/g liver weight) and it is near control values on 14 days posttreatment (465.1392 ± 38.8 mM Pi formed/g liver weight). On 28 days posttreatment, (403.022 ± 38.3 mM Pi formed/g liver weight) and 165 days posttreatment (283.94 ± 25.7 mM Pi formed/g liver weight), the activity of the enzyme G-6-Pase is significantly below the control values.

(b) \(2.0 \, \mu\text{Ci/g body weight of Ca}^{45}\):  
The activity of G-6-Pase declines during early intervals. Minimum values are observed on 5 days posttreatment (243.0541 ± 9.69 mM Pi formed/g liver weight). Thereafter, the activity increases. The values are slightly above control values on 14 days after Ca\(^{45}\) injection (493.2796 ± 42.16 mM Pi formed/g liver weight). Another decrease in the activity of the enzyme is observed on 28 days posttreatment (377.685 ± 20.61 mM Pi formed/g liver weight). On 165 days posttreatment, the activity of G-6-Pase shows further decline (218.4637 ± 46.6 mM Pi formed/g liver weight).
**Phosphohexose Isomerase (PHI):** Fig. 45, Table X

**Control:** The activity of PHI in the liver of control (unirradiated) Swiss albino mice is $359.58 \pm 16.65 \mu g$ fructose formed/g liver weight.

**Experimental:**

(a) $1.0 \mu Ci/g$ body weight of $Ca^{45}$

The activity of PHI from the liver of mice injected with $1.0 \mu Ci/g$ body weight of $Ca^{45}$ shows significant decrease during early intervals. Minimum values are observed on 5 days posttreatment ($152.04 \pm 11.14 \mu g$ fructose formed/g liver weight). There is an increase in the activity of the enzyme on 7 and 14 days posttreatment. Near control values of PHI activity are observed on 14 days posttreatment ($366.6 \pm 19.83 \mu g$ fructose formed/g liver weight). On 28 days and 165 days posttreatment, the activity of PHI is significantly below the control values ($319.99 \pm 14.08$ and $179.9 \pm 18.65 \mu g$ fructose formed/g liver weight respectively).

(b) $2.0 \mu Ci/g$ body weight of $Ca^{45}$

The activity of PHI declines during early intervals after $Ca^{45}$ injection. Minimum values are observed on 5 days posttreatment ($120.08 \pm 12.85 \mu g$ fructose formed/g liver weight). An increase in the activity of the enzyme is
observed on 7 days posttreatment (225.74 ± 6.95 μg fructose formed/g liver weight). Control values of PGI activity are observed on 14 days posttreatment (359.58 ± 11.20 μg fructose formed/g liver weight). Another decrease in the activity of PGI is observed on 28 days (293.13 ± 11.47 μg fructose formed/g liver weight) and on 165 days posttreatment (142.7 ± 14.70 μg fructose formed/g liver weight).

**Glutamate pyruvate transaminase (GPT):** Fig. 46, Table X1

**Control:** The activity of GPT in the liver of control Swiss albino mice is 90.846 ± 2.86 mM Na pyruvate formed/g liver weight.

**Experimental:**

(a) 1.0 μCi/g body weight of Ca⁴¹

The activity of GPT shows a decline from 1 day posttreatment onwards. Minimum values are observed on 5 days after Ca⁴¹ injection (72.8946 ± 23.0 mM sodium pyruvate formed/g liver weight). An increase in the activity of the enzyme is observed on 7 days posttreatment (80.86 ± 5.70 mM sodium pyruvate formed/g liver weight) and near control values are observed on 14 days posttreatment (89.6229 ± 23.80 mM sodium pyruvate formed/g liver weight). Another decrease in the activity of GPT is observed on 28 days posttreatment (87.89
17.32 m\(\text{M} \) sodium pyruvate formed/g liver weight). The activity of the enzyme shows minimum values on 165 days posttreatment (64.814 \(\pm\) 16.7 m\(\text{M} \) sodium pyruvate formed/g liver weight).

(b) 2.0 mCi/g body weight of Ca\(^{45}\)

The activity of GPT in the liver of Swiss albino mice after Ca\(^{45}\) injection declines during early intervals. Minimum values are observed on 5 days posttreatment (66.46 \(\pm\) 16.3 m\(\text{M} \) sodium pyruvate formed/g liver weight). The activity of GPT is enhanced on 7 days posttreatment (76.477 \(\pm\) 6.10 m\(\text{M} \) sodium pyruvate formed/g liver weight) and near control values are observed on 14 days posttreatment (85.242 \(\pm\) 7.90 m\(\text{M} \) sodium pyruvate formed/g liver weight). On 28 days posttreatment, there is again a decrease in the activity of GPT (83.774 \(\pm\) 11.57 m\(\text{M} \) sodium pyruvate formed/g liver weight). The activity of the enzyme is significantly below control value on 165 days posttreatment (57.1306 \(\pm\) 10.24 m\(\text{M} \) sodium pyruvate formed/g liver weight).

Glutamate oxalacetate transaminase (GOT): Fig. 117, Table X11

Control: The activity of GOT in the liver of control (unirradiated) Swiss albino mice is 76.477 \(\pm\) 6.96 m\(\text{M} \) sodium pyruvate formed/g liver weight.
Experimental:

(a) 1.0 μCi/g body weight of Ca$^{45}$

The activity of GOT in the liver of Swiss albino mice decreases during early intervals after Ca$^{45}$ injection. Minimum values are observed on 5 days posttreatment (66.993 ± 12.85 mM sodium pyruvate formed/g liver weight). Thereafter, the activity of GOT increases, and near control values are observed on 14 days posttreatment (74.9869 ± 11.66 mM sodium pyruvate formed/g liver weight). There is a significant decrease in the activity of GOT on 165 days posttreatment (59.3352 ± 31.115 mM sodium pyruvate formed/g liver weight).

(b) 2.0 μCi/g body weight of Ca$^{45}$

The activity of GOT in the liver of Swiss albino mice after Ca$^{45}$ injection declines from 1 day posttreatment onwards. Minimum activity is observed on 5 days posttreatment (61.45 ± 7.87 mM sodium pyruvate formed/g liver weight). An increase in the activity of GOT is observed on 7 days posttreatment (67.0012 ± 18.76 mM sodium pyruvate formed/g liver weight) and the activity of enzyme is near control values on 14 days posttreatment (74.23 ± 15.65 mM sodium pyruvate formed/g liver weight). Another decline in the activity of GOT is observed on 28 days posttreatment (69.1104 ± 11.89 mM sodium pyruvate formed/g liver weight) and the activity of the enzyme remains
significantly below control values on 165 days posttreatment (48.61 ± 11.47 mm sodium pyruvate formed/g liver weight).

**Acid phosphatase (ACP):** Fig. 48, Table XIII

**Control:** The activity of acid phosphatase (ACP) in the liver of control (unirradiated) Swiss albino mice is 2374.9911 ± 194.40 μg Pi formed/g liver weight.

**Experimental:**

(a) **1.0 μCi/g body weight of Ca⁴⁵:**

The activity of ACP in the liver of Swiss albino mice after Ca⁴⁵ injection show an increase. Maximum values are observed on 5 days posttreatment (4222.6385 ± 79.76 μg Pi formed/g liver weight). Thereafter, the activity of ACP decreases from 7 days posttreatment (3332.99 ± 454.88 μg Pi formed/g liver weight), and the near control values are observed on 14 days posttreatment (2404.252 ± 42.02 μg Pi formed/g liver weight) and the values remain significantly above control values on 165 days posttreatment (3330.76 ± 58.56 μg Pi formed/g liver weight).

(b) **2.0 μCi/g body weight of Ca⁴⁵:**

The activity of ACP shows an increase after Ca⁴⁵ injection. Maximum values are observed on 5 days posttreatment (4834.67
+ 82.96 μg Fi formed/g liver weight). On 7 days posttreatment, a decrease in the activity of enzyme is observed (3910.18 ± 27.29 μg Fi formed/g liver weight) and the near control values are observed on 14 days posttreatment (2356.50 ± 38.87 μg Fi formed/g liver weight). The activity of AcP again increases on 28 days posttreatment (3120.84 ± 194.40 μg Fi formed/g liver weight) and remains significantly above control values on 165 days posttreatment (3536.96 ± 40.48 μg Fi formed/g liver weight).

**Alkaline phosphatase (AP):** Fig. Lg , Table XIV

**Control:** The activity of alkaline phosphatase (AP) in the liver of control (unirradiated) Swiss albino mice is 3197.0527 ± 163.14275 μg Fi formed/g liver weight.

**Experimental:**

(a) 1.0 μCi/g body weight of Ca$^{45}$.

The activity of AP in the liver of Swiss albino mice after Ca$^{45}$ injection shows an increase from 1 day onwards. Maximum values are observed on 5 days posttreatment (4937.4632 ± 97.85 μg Fi formed/g liver weight). From 7 days posttreatment, the activity starts decreasing (3659.02 ± 74.64 μg Fi formed/g liver weight) and near control values are observed on 14 days posttreatment (3084.3662 ± 124.28 μg Fi formed/g liver weight).
An increase in the activity of AP is again observed on 28 days posttreatment (3528.6721 ± 130.94 µg Pi formed/g liver weight) and the activity remains significantly above control values on 165 days posttreatment (3133.58 ± 340.88 µg Pi formed/g liver weight).

(b) 2.0 µCi/g body weight of Ca

The activity of AP in Swiss albino mice after Ca\(^{45}\) injection shows an increase during early intervals. Maximum values are observed on 5 days posttreatment (5904.97 ± 62.143 µg Pi formed/g liver weight). From 7 days posttreatment, the activity starts decreasing and near control values are observed on 14 days posttreatment (3219.67 ± 139.425 µg Pi formed/g liver weight). Another increase in the activity of AP is observed on 28 days posttreatment (3910.18 ± 76.171 µg Pi formed/g liver weight) and the values remain significantly above the control values on 165 days posttreatment (3931.07 ± 145.75 µg Pi formed/g liver weight).

B. Indian Desert Gerbil (Meriones hurrianae, Jerdon)

(i) Glycogen: (Fig. 50, Table VII)

Control: The glycogen content in the liver of control (unirradiated) Indian desert gerbil (Meriones hurrianae, Jerdon) is 72.618 ± 0.843 mg/g liver weight.
Experimental:

(a) *1.0 µCi/g body weight of Ca$_{45}$*

The glycogen content in the liver of Indian desert gerbil (*Meriones hurrianae*, Jerdon) decreases during early intervals. Minimum values are observed on 3 days after Ca$_{45}$ injection (55.42 ± 3.78 mg/g liver weight). There is an increase in the glycogen content from 5 days onwards and near control values are observed on 14 days (69.275 ± 3.08 mg/g liver weight) and on 28 days posttreatment (73.893 ± 4.26 mg/g liver weight).

(b) *2.0 µCi/g body weight of Ca$_{45}$*

The glycogen content in the liver decreases from 1 day posttreatment onwards. Minimum values are observed on 5 days posttreatment (43.47 ± 1.65 mg/g liver weight). Thereafter, the liver glycogen content starts increasing from 7 days onwards (55.42 ± 1.40 mg/g liver weight). However, the glycogen content still remains significantly below control levels on 14 days posttreatment (62.975 ± 2.86 mg/g liver weight).

(ii) **Phosphorylase (glycogen degradative):** Fig. 51, Table VII

Control: - The activity of phosphorylase (glycogen degradative) in the liver of control (unirradiated) Indian desert gerbils
(Meriones hurrianae, Jerdon) is 262.1893 ± 3.85 mg glucose formed/g liver weight.

Experimental:

(a) 1.0 μCi/g body weight of Ca⁴⁵:
There is an increase in the activity of phosphorylase (glycogen degradative) after Ca⁴⁵ injection. Maximum activity is observed on 3 days posttreatment (338.6415 ± 3.78 mg glucose formed/g liver weight). From 5 days after Ca⁴⁵ injection, the activity of the phosphorylase (UD) starts decreasing and control values are observed on 14 days (262.1893 ± 10.30 mg glucose formed/g liver weight) and 28 days (265.77 ± 8.76 mg glucose formed/g liver weight) after Ca⁴⁵ injection.

(b) 2.0 μCi/g body weight of Ca⁴⁵:
Following Ca⁴⁵ injection, the activity of phosphorylase (glycogen degradative) shows an increase. Maximum values are observed on 5 days posttreatment (407.0376 ± 17.32 mg glucose formed/g liver weight). From 7 days posttreatment, the activity of the enzyme starts declining (355.3910 ± 11.67 mg glucose formed/g liver weight). However, the value remains significantly higher than control values on 14 days posttreatment (306.9708 ± 10.24 mg glucose formed/g liver weight).
(iii) **Phosphorylase (glycogen synthesis):** Fig. 5.2, Table V111

**Control:** The activity of phosphorylase (glycogen synthesis) in the liver of control (unirradiated) Indian desert gerbil (*Meriones hurrianae*, Jerdon) is $968.0438 \pm 152.61$ mM Pi formed/g liver weight.

**Experimental:**

(a) **1.0 $\mu$Ci/g body weight of Ca$^{45}$:**

There is a decrease in the activity of phosphorylase (glycogen synthesis) in the liver of Indian desert gerbil after 1.0 $\mu$Ci/g body weight of Ca$^{45}$. Minimum values are observed on 3 days posttreatment ($725.8077 \pm 38.87$ mM Pi formed/g liver weight). From 5 days onwards, the activity of the enzyme starts increasing and reaches near control values on 14 days ($972.8818 \pm 13.92$ mM Pi formed/g liver weight) and on 28 days ($967.0939 \pm 58.56$ mM Pi formed/g liver weight).

(b) **2.0 $\mu$Ci/g body weight of Ca$^{45}$:**

The activity of the enzyme phosphorylase (glycogen synthesis) shows a decline during early intervals after Ca$^{45}$ injection. The values are minimum on 5 days posttreatment ($574.6897 \pm 20.48$ mM Pi formed/g liver weight). From 7 days posttreatment, the activity shows an increase ($648.30 \pm 117.12$ mM Pi formed/g liver weight) but remains significantly below control values.
on 14 days posttreatment (779.2678 ± 30.80 mM P1 formed/g liver weight).

**Glucose-6-phosphatase (G-6-Phase):** Fig. 53, Table IX

*Control:* The activity of glucose-6-phosphatase (G-6-Phase) in the liver of control (unirradiated) Indian desert gerbils (*Meriones hurrianae*, Jerdon) is 651.34 ± 11.05 mM Pi formed/g liver weight).

**Experimental:**

(a) **1.0 μCi/g body weight of Ca**$^{45}$:

The activity of glucose-6-phosphatase (G-6-Phase) in the liver of gerbils after Ca$^{45}$ injection increases during early intervals. Maximum values are observed on 3 days posttreatment (1198.9757 ± 3.81 mM Pi formed/g body weight). Thereafter, the activity starts decreasing from 5 days onwards. The activity is slightly above control values on 14 days posttreatment (677.28 ± 20.4 mM Pi formed/g liver weight), and near control value on 28 days posttreatment (662.686 ± 30.60 mM Pi formed/g liver weight).

(b) **2.0 μCi/g body weight of Ca**$^{45}$:

The activity of G-6-Phase in the liver of gerbils after Ca$^{45}$
injection shows an increase. Maximum values are observed on 5 days posttreatment (1701.70 ± 16.06 mM Pi formed/g liver weight). From 7 days, the activity starts declining but remains significantly above control values on 14 days after Ca⁴⁵ administration (850.85 ± 10.09 mM Pi formed/g liver weight).

**Phosphohexose isomerase (PHI):** Fig. 54, Table X

**Control:** The activity of PHI in the liver of control (unirradiated) gerbils is 438.71 ± 27.95 µg fructose formed/g liver weight.

**Experimental:**

(a) 1.0 µCi/g body weight of Ca⁴⁵:

The activity of PHI in the liver of Indian desert gerbil (*Meriones hurrianae*, Jerdon) decreases during early intervals. Minimum activity of the enzyme is observed on 3 days posttreatment (308.03 ± 21.30 µg fructose formed/g liver weight). From 5 days onwards, the activity of PHI increases. However, the activity of enzyme remains significantly below control levels on 14 and 28 days posttreatment (400.61 ± 11.89 and 420.05 ± 13.64 µg fructose formed/g liver weight).
(b) 2.0 μCi/g body weight of Ca<sup>45</sup>: 

The activity of PHi in the liver of gerbils decreases reaching minimum values on 5 days posttreatment (243.23 ± 13.42 μg fructose formed/g liver weight). From 7 days posttreatment onwards, the activity starts increasing. However, the PHi activity remains significantly below control values on 14 days posttreatment (369.64 ± 15.65 μg fructose formed/g liver weight).

**Glutamate pyruvate transaminase (GPT):** Fig. 55, Table XI

**Control:** The activity of GPT in the liver of control (unirradiated) Indian desert gerbils (*Meriones hurrianae*, Jerdon) is 104.765 ± 3.78 mM sodium pyruvate formed/g liver weight.

**Experimental:**

(a) 1.0 μCi/g body weight of Ca<sup>45</sup>: 

The activity of GPT in the liver of Indian desert gerbils (*Meriones hurrianae*, Jerdon) after Ca<sup>45</sup> injection decreases during early intervals. Minimum values are observed on 5 days posttreatment (85.9377 ± 2.8 mM sodium pyruvate formed/g liver weight). Thereafter, the activity starts increasing. Near control values of the activity of GPT are observed on 14 days posttreatment (100.489 ± 10.31 mM sodium pyruvate
formed/g liver weight) and on 28 days posttreatment (103.6663 ± 12.70 mM sodium pyruvate formed/g liver weight).

(b) 2.0 μCi/g body weight of Ca\(^{45}\):

Significant decrease in the activity of GPT is observed in the liver of gerbils after 2.0 μCi/g body weight of Ca\(^{45}\) injection. Minimum values of the activity are observed on 5 days posttreatment (66.4639 ± 17.50 mM sodium pyruvate formed/g liver weight). From 7 days onwards, the activity of GPT starts increasing (84.5563 ± 12.10 mM sodium pyruvate formed/g liver weight). However, the values remain significantly below control values on 14 days posttreatment (93.4814 ± 21.5 mM sodium pyruvate formed/g liver weight).

Glutamate oxalacetae transaminase (GOT): Fig. 56, Table XII

Control:-- The activity of glutamate oxalacetae transaminase (GOT) in the liver of control (unirradiated) Indian desert gerbils (*Meriones hurrianus*, Jerdon) is 119.426 ± 26.495 mM sodium pyruvate formed/g liver weight.

Experimental:

(a) 1.0 μCi/g body weight of Ca\(^{45}\):

GOT activity in the liver of gerbils after Ca\(^{45}\) injection decreases during early intervals. Minimum values are observed
on 5 days posttreatment (91.6977 ± 21.30 mm sodium pyruvate formed/g liver weight). From 7 days onwards, the activity starts increasing (103.8295 ± 10.69 mm sodium pyruvate formed/g liver weight). The values are significantly below the control values on 14 days posttreatment (112.1677 ± 40.78 mm sodium pyruvate formed/g liver weight) and near control values of the activity of GOT are observed on 28 days posttreatment (118.778 ± 4.26 mm sodium pyruvate formed/g liver weight).

(b) 2.0 μCi/g body weight of Ca⁴⁵:

GOT activity in the liver of Indian desert gerbils (Meriones hurrianae, Jerdon) shows significant decrease during early intervals after Ca⁴⁵ injection. Minimum values are observed on 5 days posttreatment (69.8518 ± 17.33 mm sodium pyruvate formed/g liver weight). From 7 days posttreatment, the activity of GOT starts increasing (82.754 ± 10.24 mm sodium pyruvate formed/g liver weight). However, the activity remained significantly below the control values on 14 days posttreatment (102.157 ± 13.645 mm sodium pyruvate formed/g liver weight).

Acid phosphatase (AcP): Fig. 57, Table XIII

Control: The activity of acid phosphatase (AcP) in the liver
of control (unirradiated) Indian desert gerbils (*Meriones hurrianae*, Jerdon) is $2339.6041 + 152.61 \mu g \text{ Pi formed/g liver weight.}$

**Experimental:**

(a) 1.0 $\mu$Ci/g body weight of Ca$^{45}$

The activity of ACP in the liver of gerbils after Ca$^{45}$ injection shows an increase. Maximum values are observed on 3 days posttreatment ($3665.21 + 153.17 \mu g \text{ Pi formed/g liver weight}$). Thereafter, the ACP activity decreases from 5 days posttreatment ($3457.2267 + 75.28 \mu g \text{ Pi formed/g liver weight}$). The activity is slightly above control values on 14 days posttreatment which is not significant ($2505.2889 + 47.57 \mu g \text{ Pi formed/g liver weight}$) and near control values on 28 days posttreatment ($2274.697 + 47.03 \mu g \text{ Pi formed/g liver weight}$).

(b) 2.0 $\mu$Ci/g body weight of Ca$^{45}$

The activity of ACP shows an increase from 1 day onwards. Maximum values are observed on 5 days posttreatment ($4922.16 + 188.92 \mu g \text{ Pi formed/g liver weight}$). From 7 days after Ca$^{45}$ injection, the activity starts decreasing ($4386.36 + 72.43 \mu g \text{ Pi formed/g liver weight}$). However, the values remain significantly above control values on 14 days posttreatment ($3120.847 + 97.85 \mu g \text{ Pi formed/g liver weight}$).
Alkaline phosphatase (AP): Fig. 5.8, Table XIV

Control: The activity of alkaline phosphatase (AP) in the liver of Indian desert gerbils (Meriones hurrianae, Jerdon) is $3306.5172 \pm 118.91 \mu g Fi$ formed/g liver weight.

Experimental:

(a) $1.0 \mu Ci/g$ body weight of Ca$^{45}$.

The activity of AP in the liver of gerbils after Ca$^{45}$ injection shows an increase during early intervals. Maximum activity of the enzyme is observed on 3 days posttreatment ($4386.3603 \pm 275.74 \mu g Fi$ formed/g liver weight). After that, the activity of AP starts decreasing from 5 days posttreatment onwards ($3752.8878 \pm 285.60 \mu g Fi$ formed/g liver weight). Near control values of the enzyme activity are observed on 14 days posttreatment ($3236.3428 \pm 69.60 \mu g Fi$ formed/g liver weight) and on 28 days posttreatment ($3332.9914 \pm 294.0 \mu g Fi$ formed/g liver weight).

(b) $2.0 \mu Ci/g$ body weight of Ca$^{45}$.

Significant increase in the activity of AP in the liver of gerbils after Ca$^{45}$ injection is observed. Maximum activity is observed on 5 days posttreatment ($5348.411 \pm 116.70 \mu g Fi$ formed/g liver weight). Thereafter, the activity starts...
decreasing from 7 days posttreatment ($4115.7246 \pm 140.99 \mu g$ Pi formed/g liver weight). However, the values are significantly above control values on 14 days posttreatment ($3620.1916 \pm 312.16 \mu g$ Pi formed/g liver weight).
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<td>5.50 ±</td>
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<td>1.5 ±</td>
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<td></td>
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<td>14.8 ±</td>
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<tr>
<td></td>
<td>2.0 μCi/g</td>
<td>17.0 ±</td>
<td>27.0 ±</td>
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<td>13.50 ±</td>
<td>2.2 ±</td>
<td>19.5 ±</td>
<td>3.25 ±</td>
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<td>2.225±</td>
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<td>BINUCLEATED CELLS (%)</td>
<td>1.0 μCi/g</td>
<td>6.75 ±</td>
<td>11.0 ±</td>
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<td></td>
<td>2.0 μCi/g</td>
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<td>16.5 ±</td>
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<td>9.5 ±</td>
<td>15.5 ±</td>
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<td>MULTINUCLEATED CELLS (%)</td>
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<td>-</td>
<td>-</td>
<td>2.5 ±</td>
<td>1.5 ±</td>
<td></td>
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<td>body weight</td>
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<td></td>
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<td>6.5 ±</td>
<td></td>
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<tr>
<td></td>
<td>2.0 μCi/g</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<td>-</td>
<td>5.6 ±</td>
<td>4.2 ±</td>
<td></td>
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<td></td>
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<td>body weight</td>
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<td></td>
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<td>10.0 ±</td>
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</tbody>
</table>

TABLE III

Percentage of pyknotic nuclei, enucleated cells, bi- and multinucleated cells in the liver of Swiss albino mice after the injection of Ca⁴⁺. Each value in % is an average of six to nine animals ± standard error.
<table>
<thead>
<tr>
<th>Parameters</th>
<th>Dose/Days</th>
<th>1</th>
<th>3</th>
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<th>7</th>
<th>14</th>
<th>28</th>
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<tbody>
<tr>
<td><strong>CELLULAR</strong></td>
<td>1.0 µCi/g</td>
<td>9.6 ±</td>
<td>10.6 ±</td>
<td>10.0 ±</td>
<td>9.25 ±</td>
<td>8.60 ±</td>
<td>8.50 ±</td>
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<tr>
<td>DIAMETER (µm)</td>
<td>body weight</td>
<td>1.011</td>
<td>3.79</td>
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<td>2.07</td>
<td>2.222</td>
<td>2.1</td>
</tr>
<tr>
<td></td>
<td>2.0 µCi/g</td>
<td>10.0 ±</td>
<td>11.6 ±</td>
<td>9.95 ±</td>
<td>12.5 ±</td>
<td>10.25 ±</td>
<td></td>
</tr>
<tr>
<td></td>
<td>body weight</td>
<td>2.34</td>
<td>1.59</td>
<td>1.461</td>
<td>2.25</td>
<td>1.55</td>
<td></td>
</tr>
<tr>
<td><strong>NUCLEAR</strong></td>
<td>1.0 µCi/g</td>
<td>3.45 ±</td>
<td>3.75 ±</td>
<td>3.42 ±</td>
<td>3.29 ±</td>
<td>3.50 ±</td>
<td>3.25 ±</td>
</tr>
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<td>DIAMETER (µm)</td>
<td>body weight</td>
<td>0.45</td>
<td>0.462</td>
<td>0.167</td>
<td>0.89</td>
<td>0.67</td>
<td>0.23</td>
</tr>
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<td>3.90 ±</td>
<td>3.67 ±</td>
<td>3.47 ±</td>
<td>3.65 ±</td>
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<td>0.324</td>
<td>0.159</td>
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<tr>
<td><strong>KUPFFER</strong></td>
<td>1.0 µCi/g</td>
<td>43.2 ±</td>
<td>49.8 ±</td>
<td>46.0 ±</td>
<td>41.2 ±</td>
<td>39.5 ±</td>
<td>40.0 ±</td>
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<tr>
<td>CELLS/mm²</td>
<td>body weight</td>
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<td>4.8</td>
<td>2.1</td>
</tr>
<tr>
<td></td>
<td>2.0 µCi/g</td>
<td>46.5 ±</td>
<td>55.8 ±</td>
<td>59.2 ±</td>
<td>49.7 ±</td>
<td>42.0 ±</td>
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<tr>
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<td>body weight</td>
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<td>4.75</td>
<td>4.635</td>
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<td><strong>NUCLEOLI/NUCLEUS</strong></td>
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<td>1</td>
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<tr>
<td></td>
<td>body weight</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2.0 µCi/g</td>
<td>2</td>
<td>4</td>
<td>1</td>
<td>3</td>
<td>3</td>
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</tr>
</tbody>
</table>
TABLE V

Percentage of pyknotic nuclei, enucleated, bi- and multinucleated cells in the liver of Indian desert gerbil (Meriones hurrianae, Jerdon) after the injection of Ca\textsuperscript{45}. Each value in % is an average of six to nine animals + standard error.

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Dose/Days</th>
<th>1</th>
<th>3</th>
<th>5</th>
<th>7</th>
<th>14</th>
<th>28</th>
</tr>
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<tbody>
<tr>
<td><strong>Pyknotic Nuclei (%)</strong></td>
<td>1.0 μCi/g</td>
<td>2.25 ±</td>
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<td>3.5 ±</td>
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<td>-</td>
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<td>0.6122</td>
<td>-</td>
<td>-</td>
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<td>-</td>
</tr>
<tr>
<td></td>
<td>2.0 μCi/g</td>
<td>5.25 ±</td>
<td>23.5 ±</td>
<td>7.5 ±</td>
<td>2.2 ±</td>
<td>-</td>
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<td>8.0 ±</td>
<td>19.5 ±</td>
<td>13.5 ±</td>
<td>4.5 ±</td>
<td>0.5 ±</td>
<td>-</td>
</tr>
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<td>0.19</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>2.0 μCi/g</td>
<td>13.0 ±</td>
<td>29.8 ±</td>
<td>21.7 ±</td>
<td>6.5 ±</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
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<td>1.5925</td>
<td>0.3201</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<tr>
<td><strong>Binucleated Cells (%)</strong></td>
<td>1.0 μCi/g</td>
<td>11.0 ±</td>
<td>16.0 ±</td>
<td>26.0 ±</td>
<td>18.5 ±</td>
<td>8.5 ±</td>
<td>13.75 ±</td>
</tr>
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<td>1.1169</td>
<td>4.025</td>
<td>2.07</td>
<td>0.50</td>
<td>1.5</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>2.0 μCi/g</td>
<td>8.5 ±</td>
<td>22.8 ±</td>
<td>32.6 ±</td>
<td>21.5 ±</td>
<td>16.5 ±</td>
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<td>body weight</td>
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<td>3.14</td>
<td>2.344</td>
<td>0.7382</td>
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<td><strong>Multinucleated Cells (%)</strong></td>
<td>1.0 μCi/g</td>
<td>-</td>
<td>-</td>
<td>1.5 ±</td>
<td>9.6 ±</td>
<td>17.5 ±</td>
<td>1.5 ±</td>
</tr>
<tr>
<td>body weight</td>
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<td>0.155</td>
<td>2.17</td>
<td>2.5</td>
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<tr>
<td></td>
<td>2.0 μCi/g</td>
<td>-</td>
<td>-</td>
<td>5.5 ±</td>
<td>21.5 ±</td>
<td>24.5 ±</td>
<td>-</td>
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<td>1</td>
<td>3</td>
<td>5</td>
<td>7</td>
<td>14</td>
<td>28</td>
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<td>-----------</td>
<td>-----------</td>
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<td>-----------</td>
<td>-----------</td>
</tr>
<tr>
<td>Swiss albino mice</td>
<td>1.0 μCi/g</td>
<td>43.08 ±</td>
<td>46.4 ±</td>
<td>55.4 ±</td>
<td>50.8 ±</td>
<td>39.94 ±</td>
<td>43.47 ±</td>
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<tr>
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<td>45.6 ±</td>
<td>50.66 ±</td>
<td>59.27 ±</td>
<td>54.33 ±</td>
<td>41.45 ±</td>
<td>49.98 ±</td>
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<tr>
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<td>0.695</td>
<td>4.0785</td>
<td>1.0695</td>
<td>1.342</td>
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<td>Indian desert gerbil</td>
<td>1.0 μCi/g</td>
<td>66.6 ±</td>
<td>55.42 ±</td>
<td>59.27 ±</td>
<td>61.44 ±</td>
<td>69.27 ±</td>
<td>73.89 ±</td>
</tr>
<tr>
<td>(Meriones hirundine, Jerdon)</td>
<td>body weight</td>
<td>2.94</td>
<td>3.78</td>
<td>0.695</td>
<td>2.13</td>
<td>3.08</td>
<td>4.26</td>
</tr>
<tr>
<td>2.0 μCi/g</td>
<td></td>
<td>61.44 ±</td>
<td>49.98 ±</td>
<td>43.47 ±</td>
<td>55.42 ±</td>
<td>62.97 ±</td>
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<td>3.08</td>
<td>1.65</td>
<td>1.40</td>
<td>2.86</td>
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</table>

Glycogen concentration in control animals: Swiss albino mice 39.6 ± 0.6605

Indian desert gerbil 72.618 ± 0.84
TABLE VII

Phosphorylase (glycogen degradative) activity (mg glucose formed/g liver) in the liver
of Swiss albino mice and Indian desert gerbil (Meriones hurrianae, Jerdon) after the injection
of Ca$^{45}$. Each value is the average of six to nine animals ± standard error

<table>
<thead>
<tr>
<th>Animals</th>
<th>Dose/Body Weight</th>
<th>1</th>
<th>3</th>
<th>5</th>
<th>7</th>
<th>14</th>
<th>28</th>
<th>165</th>
</tr>
</thead>
<tbody>
<tr>
<td>Swiss albino mice</td>
<td>1.0 µCi/g body</td>
<td>262.18 ± 207.24 ± 164.21 ± 166.19 ± 314.50 ± 274.63 ± 302.13 ± 7.46 ± 12.42</td>
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<td></td>
<td></td>
<td></td>
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<td>4.03</td>
<td>3.46</td>
<td>13.09</td>
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<td>12.42</td>
</tr>
<tr>
<td></td>
<td>2.0 µCi/g body</td>
<td>245.03 ± 193.96 ± 142.42 ± 159.76 ± 315.87 ± 251.97 ± 280.50 ± 6.21 ± 4.26</td>
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<td>1.60</td>
<td>9.00</td>
<td>6.03</td>
<td>6.21</td>
<td>4.26</td>
</tr>
<tr>
<td>Indian desert gerbil</td>
<td>1.0 µCi/g body</td>
<td>284.84 ± 338.64 ± 315.87 ± 284.31 ± 262.18 ± 265.77 ± 8.76 ± -</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>(Meriones hurrianae,</td>
<td>weight</td>
<td>1.55</td>
<td>3.78</td>
<td>6.98</td>
<td>9.13</td>
<td>10.30</td>
<td>8.76</td>
<td>-</td>
</tr>
<tr>
<td>Jerdon)</td>
<td>2.0 µCi/g body</td>
<td>307.06 ± 372.50 ± 407.03 ± 355.39 ± 306.97 ± - ± -</td>
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<td>weight</td>
<td>4.54</td>
<td>5.38</td>
<td>17.32</td>
<td>11.67</td>
<td>10.24</td>
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</tr>
</tbody>
</table>

Enzyme activity in control animals: Swiss albino mice 307.06 ± 4.54

Indian desert gerbil 262.18 ± 3.85
### TABLE VIII

Phosphorylase (glycogen synthesis) activity (mM phosphate (Pi) formed/g liver) in the liver of Swiss albino mice and Indian desert gerbil (*Meriones hirundinace*, Jerdon) after the injection of Ca\(^{45}\). Each value is the average of six to nine animals ± standard error.

<table>
<thead>
<tr>
<th>Animals</th>
<th>Dose/Days</th>
<th>1</th>
<th>3</th>
<th>5</th>
<th>7</th>
<th>14</th>
<th>28</th>
<th>165</th>
</tr>
</thead>
<tbody>
<tr>
<td>Swiss albino mice</td>
<td>1.0 μCi/g</td>
<td>702.33 ±</td>
<td>785.46 ±</td>
<td>972.98 ±</td>
<td>862.03 ±</td>
<td>574.68 ±</td>
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<td>11.89 ±</td>
<td>13.64 ±</td>
<td>78.78 ±</td>
<td>76.30 ±</td>
<td>86.60 ±</td>
<td>10.30 ±</td>
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<td>788.21 ±</td>
<td>890.36 ±</td>
<td>1198.97 ±</td>
<td>941.75 ±</td>
<td>534.87 ±</td>
<td>826.57 ±</td>
<td>319.11 ±</td>
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<tr>
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<td>45.48 ±</td>
<td>33.38 ±</td>
<td>40.78 ±</td>
<td>54.58 ±</td>
<td>156.5 ±</td>
<td>47.02 ±</td>
</tr>
<tr>
<td>Indian desert gerbil</td>
<td>1.0 μCi/g</td>
<td>826.57 ±</td>
<td>725.80 ±</td>
<td>785.46 ±</td>
<td>869.1763</td>
<td>972.98 ±</td>
<td>967.09 ±</td>
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</tr>
<tr>
<td>body weight</td>
<td></td>
<td>29.40 ±</td>
<td>38.87 ±</td>
<td>79.76 ±</td>
<td>24.52 ±</td>
<td>13.92 ±</td>
<td>58.56 ±</td>
<td>-</td>
</tr>
<tr>
<td>(Meriones hirundinace, Jerdon)</td>
<td>2.0 μCi/g</td>
<td>792.31 ±</td>
<td>667.86 ±</td>
<td>574.68 ±</td>
<td>648.30 ±</td>
<td>779.26 ±</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>body weight</td>
<td></td>
<td>28.60 ±</td>
<td>42.60 ±</td>
<td>20.48 ±</td>
<td>117.12 ±</td>
<td>30.60 ±</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

Enzyme activity in control animals: Swiss albino mice 552.32 ± 84.63

Indian desert gerbil 968.04 ± 152.61
<table>
<thead>
<tr>
<th>Animals</th>
<th>Dose/Days</th>
<th>1</th>
<th>3</th>
<th>5</th>
<th>7</th>
<th>14</th>
<th>28</th>
<th>165</th>
</tr>
</thead>
<tbody>
<tr>
<td>Swiss albino mice</td>
<td>1.0 µCi/g</td>
<td>436.92</td>
<td>372.15</td>
<td>283.94</td>
<td>397.90</td>
<td>465.13</td>
<td>403.02</td>
<td>283.94</td>
</tr>
<tr>
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<td>body weight</td>
<td>26.65</td>
<td>9.23</td>
<td>13.15</td>
<td>46.2</td>
<td>38.8</td>
<td>38.3</td>
<td>25.7</td>
</tr>
<tr>
<td></td>
<td>2.0 µCi/g</td>
<td>397.04</td>
<td>338.64</td>
<td>243.05</td>
<td>358.57</td>
<td>493.27</td>
<td>377.68</td>
<td>218.46</td>
</tr>
<tr>
<td></td>
<td>body weight</td>
<td>31.16</td>
<td>21.47</td>
<td>9.69</td>
<td>20.45</td>
<td>42.16</td>
<td>20.61</td>
<td>46.6</td>
</tr>
<tr>
<td>Indian desert gerbil</td>
<td>1.0 µCi/g</td>
<td>737.11</td>
<td>1198.97</td>
<td>968.04</td>
<td>717.14</td>
<td>677.28</td>
<td>662.68</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>body weight</td>
<td>8.17</td>
<td>3.81</td>
<td>14.80</td>
<td>11.83</td>
<td>20.4</td>
<td>30.6</td>
<td>-</td>
</tr>
<tr>
<td>Meriones hurrinae, Jerdon</td>
<td>2.0 µCi/g</td>
<td>801.64</td>
<td>1354.56</td>
<td>1701.70</td>
<td>992.12</td>
<td>850.85</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>body weight</td>
<td>10.09</td>
<td>22.6</td>
<td>16.06</td>
<td>8.16</td>
<td>10.09</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Enzyme activity in control animals: Swiss albino mice 474.79 ± 5.18
Indian desert gerbil 651.34 ± 11.05
**TABLE X**

Phosphohexose isomerase (PHI) activity (μg fructose formed/g liver) in the liver of Swiss albino mice and Indian desert gerbil (*Meriones hurrianae*, Jerdon) after the injection of Ca$^{45}$. Each value is the average of six to nine animals + standard error.

<table>
<thead>
<tr>
<th>Animals</th>
<th>Dose/Days</th>
<th>1</th>
<th>3</th>
<th>5</th>
<th>7</th>
<th>14</th>
<th>28</th>
<th>165</th>
</tr>
</thead>
<tbody>
<tr>
<td>Swiss albino</td>
<td>1.0 μCi/g</td>
<td>297.22 ±</td>
<td>223.51 ±</td>
<td>152.04 ±</td>
<td>237.26 ±</td>
<td>366.6 ±</td>
<td>319.99 ±</td>
<td>179.9 ±</td>
</tr>
<tr>
<td></td>
<td>2.0 μCi/g</td>
<td>278.97 ±</td>
<td>205.91 ±</td>
<td>120.08 ±</td>
<td>225.74 ±</td>
<td>359.58 ±</td>
<td>293.13 ±</td>
<td>142.7 ±</td>
</tr>
<tr>
<td></td>
<td>body weight</td>
<td>19.5</td>
<td>12.8</td>
<td>12.65</td>
<td>6.95</td>
<td>11.20</td>
<td>11.47</td>
<td>14.70</td>
</tr>
<tr>
<td>Indian desert</td>
<td>1.0 μCi/g</td>
<td>361.93 ±</td>
<td>308.03 ±</td>
<td>329.03 ±</td>
<td>359.34 ±</td>
<td>400.61 ±</td>
<td>420.05 ±</td>
<td></td>
</tr>
<tr>
<td>desert (<em>Meriones hurrianae</em>, Jerdon)</td>
<td>body weight</td>
<td>14.30</td>
<td>21.30</td>
<td>24.52</td>
<td>27.95</td>
<td>11.89</td>
<td>13.64</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2.0 μCi/g</td>
<td>329.03 ±</td>
<td>273.22 ±</td>
<td>243.23 ±</td>
<td>321.71 ±</td>
<td>369.64 ±</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>body weight</td>
<td>28.60</td>
<td>16.5</td>
<td>13.42</td>
<td>26.49</td>
<td>15.65</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Enzyme activity in control animals: Swiss albino mice 359.58 ± 16.65

Indian desert gerbil 438.71 ± 27.95
TABLE XI

Glutamate pyruvate transaminase (GPT) activity (nm sodium pyruvate formed/g liver) in the liver of Swiss albino mice and Indian desert gerbil (*Meriones hurrianae*, Jerdon) after the injection of Ca\(^{45}\). Each value is the average of six to nine animals ± standard error

<table>
<thead>
<tr>
<th>Animals</th>
<th>Dose/Days</th>
<th>1</th>
<th>3</th>
<th>5</th>
<th>7</th>
<th>14</th>
<th>28</th>
<th>165</th>
</tr>
</thead>
<tbody>
<tr>
<td>Swiss albino</td>
<td>1.0 μCi/g</td>
<td>86.18 ±</td>
<td>78.38 ±</td>
<td>72.89 ±</td>
<td>80.86 ±</td>
<td>89.62 ±</td>
<td>87.89 ±</td>
<td>65.81 ±</td>
</tr>
<tr>
<td></td>
<td>body weight</td>
<td>11.40</td>
<td>13.0</td>
<td>23.00</td>
<td>5.70</td>
<td>23.80</td>
<td>17.32</td>
<td>16.70</td>
</tr>
<tr>
<td></td>
<td>2.0 μCi/g</td>
<td>84.55 ±</td>
<td>74.23 ±</td>
<td>66.46 ±</td>
<td>76.47 ±</td>
<td>85.24 ±</td>
<td>83.77 ±</td>
<td>57.13 ±</td>
</tr>
<tr>
<td>Indian desert</td>
<td>1.0 μCi/g</td>
<td>102.15 ±</td>
<td>93.46 ±</td>
<td>85.93 ±</td>
<td>91.41 ±</td>
<td>100.48 ±</td>
<td>103.66 ±</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>body weight</td>
<td>18.90</td>
<td>7.20</td>
<td>2.60</td>
<td>30.9</td>
<td>10.51</td>
<td>12.7</td>
<td></td>
</tr>
<tr>
<td>(Meriones</td>
<td>2.0 μCi/g</td>
<td>94.25 ±</td>
<td>82.75 ±</td>
<td>66.46 ±</td>
<td>84.55 ±</td>
<td>93.48 ±</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>hurrianae,</td>
<td>body weight</td>
<td>8.60</td>
<td>9.90</td>
<td>17.5</td>
<td>12.10</td>
<td>21.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jerdon)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Enzyme activity in control animals: Swiss albino mice 90.84 ± 2.86

Indian desert gerbil 104.76 ± 3.78
TABLE XII

Glutamate oxalacetate transaminase (GOT) activity (µM sodium pyruvate formed/g liver) in the liver of Swiss albino mice and Indian desert gerbil (Meriones hurrianae, Jerdon) after the injection of Ca^{45}. Each value is the average of six to nine animals ± standard error.

<table>
<thead>
<tr>
<th>Animals</th>
<th>Dose/Days</th>
<th>1</th>
<th>3</th>
<th>5</th>
<th>7</th>
<th>14</th>
<th>28</th>
<th>165</th>
</tr>
</thead>
<tbody>
<tr>
<td>Swiss albino</td>
<td>1.0 µCi/g</td>
<td>73.87 ±</td>
<td>68.39 ±</td>
<td>66.99 ±</td>
<td>71.01 ±</td>
<td>74.98 ±</td>
<td>72.89 ±</td>
<td>59.33 ±</td>
</tr>
<tr>
<td></td>
<td>2.0 µCi/g</td>
<td>73.00 ±</td>
<td>64.81 ±</td>
<td>61.45 ±</td>
<td>67.00 ±</td>
<td>74.23 ±</td>
<td>69.11 ±</td>
<td>48.61 ±</td>
</tr>
<tr>
<td>body weight</td>
<td>7.24</td>
<td>8.46</td>
<td>7.87</td>
<td>10.76</td>
<td>15.65</td>
<td>11.89</td>
<td>11.47</td>
<td></td>
</tr>
<tr>
<td>Indian desert</td>
<td>1.0 µCi/g</td>
<td>104.76 ±</td>
<td>84.55 ±</td>
<td>91.69 ±</td>
<td>103.82 ±</td>
<td>112.16 ±</td>
<td>118.77 ±</td>
<td>-</td>
</tr>
<tr>
<td>gerbil (Meriones</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>hurrianae, Jerdon)</td>
<td>17.32</td>
<td>26.49</td>
<td>21.3</td>
<td>10.69</td>
<td>40.78</td>
<td>4.26</td>
<td></td>
<td></td>
</tr>
<tr>
<td>body weight</td>
<td>2.0 µCi/g</td>
<td>93.48 ±</td>
<td>76.38 ±</td>
<td>69.85 ±</td>
<td>82.75 ±</td>
<td>102.15 ±</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>25.72</td>
<td>23.84</td>
<td>17.3</td>
<td>10.24</td>
<td>13.64</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Enzyme activity in control animals: Swiss albino mice 76.47 ± 6.96
Indian desert gerbil 119.42 ± 26.49
TABLE XIII

Acid phosphatase (AcP) activity (µg phosphate (Pi) formed/g liver) in the liver of Swiss albino mice and Indian desert gerbil (*Meriones hurrianae*, Jerdon) after the injection of Ca⁴⁵. Each value is the average of six to nine animals ± standard error

<table>
<thead>
<tr>
<th>Animals</th>
<th>Dose/Days</th>
<th>1</th>
<th>3</th>
<th>5</th>
<th>7</th>
<th>14</th>
<th>28</th>
<th>165</th>
</tr>
</thead>
<tbody>
<tr>
<td>Swiss albino</td>
<td>1 µCi/g</td>
<td>2778.46</td>
<td>3219.67</td>
<td>4222.63</td>
<td>3332.99</td>
<td>2404.24</td>
<td>2945.28</td>
<td>3330.76</td>
</tr>
<tr>
<td>body weight</td>
<td>+ 279.51</td>
<td>+ 137.87</td>
<td>+ 79.76</td>
<td>+ 454.88</td>
<td>+ 42.02</td>
<td>+ 68.20</td>
<td>+ 58.56</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2 µCi/g</td>
<td>3026.36</td>
<td>3674.89</td>
<td>4834.67</td>
<td>3910.18</td>
<td>2356.50</td>
<td>3120.84</td>
<td>3536.96</td>
</tr>
<tr>
<td>body weight</td>
<td>+ 312.16</td>
<td>+ 333.30</td>
<td>+ 82.96</td>
<td>+ 27.29</td>
<td>+ 38.87</td>
<td>+ 194.40</td>
<td>+ 40.48</td>
<td></td>
</tr>
<tr>
<td>Indian desert</td>
<td>1 µCi/g</td>
<td>2778.46</td>
<td>3665.21</td>
<td>3457.22</td>
<td>2945.28</td>
<td>2505.28</td>
<td>2274.69</td>
<td>-</td>
</tr>
<tr>
<td>(Meriones</td>
<td>body weight</td>
<td>+ 44.01</td>
<td>+ 153.17</td>
<td>+ 75.28</td>
<td>+ 100.87</td>
<td>+ 47.57</td>
<td>+ 47.03</td>
<td>-</td>
</tr>
<tr>
<td>hurrianae,</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jerdon)</td>
<td>2 µCi/g</td>
<td>2897.38</td>
<td>3996.13</td>
<td>4922.16</td>
<td>4386.36</td>
<td>3120.84</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>body weight</td>
<td>+ 257.22</td>
<td>+ 39.61</td>
<td>+ 188.92</td>
<td>+ 72.43</td>
<td>+ 97.65</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

Enzyme activity in control animals: Swiss albino mice 2374.99 ± 194.40

Indian desert gerbil 2339.60 ± 152.61
TABLE XIV

Alkaline phosphatase (AP) activity (μg phosphate (Pi) formed/g liver) in the liver of
Swiss albino mice and Indian desert gerbil (*Meriones hurrianae*, Jerdon)
after the injection of Ca\(^{45}\). Each value is the average of six to
nine animals ± standard error

<table>
<thead>
<tr>
<th>Animals</th>
<th>Dose/Days</th>
<th>1</th>
<th>3</th>
<th>5</th>
<th>7</th>
<th>14</th>
<th>28</th>
<th>165</th>
</tr>
</thead>
<tbody>
<tr>
<td>Swiss albino mice</td>
<td>1.0 μCi/g</td>
<td>3457.22</td>
<td>3991.96</td>
<td>4937.46</td>
<td>3659.02</td>
<td>3084.36</td>
<td>3528.67</td>
<td>3133.58</td>
</tr>
<tr>
<td>body weight</td>
<td></td>
<td>± 128.61</td>
<td>± 94.46</td>
<td>± 97.85</td>
<td>± 74.64</td>
<td>± 124.28</td>
<td>± 130.94</td>
<td>± 340.88</td>
</tr>
<tr>
<td></td>
<td>2.0 μCi/g</td>
<td>3803.04</td>
<td>4322.50</td>
<td>5904.97</td>
<td>4154.56</td>
<td>3219.67</td>
<td>3910.18</td>
<td>3931.07</td>
</tr>
<tr>
<td>body weight</td>
<td></td>
<td>± 165.76</td>
<td>± 166.26</td>
<td>± 62.14</td>
<td>± 125.54</td>
<td>± 139.42</td>
<td>± 76.171</td>
<td>± 145.75</td>
</tr>
</tbody>
</table>

Indian desert gerbil (Meriones hurrianae, Jerdon)

|                      | 1.0 μCi/g | 3674.89 | 4386.36 | 3752.88 | 3528.67 | 3236.34 | 3332.99 | -   |
| body weight           |           | ± 279.51 | ± 275.74 | ± 285.60 | ± 87.60 | ± 69.60 | ± 294.00 | -   |
|                      | 2.0 μCi/g | 3803.04 | 4824.99 | 5348.41 | 4115.72 | 3620.17 | -   | -   |
| body weight           |           | ± 102.40 | ± 173.20 | ± 116.70 | ± 140.99 | ± 312.16 | -   | -   |

Enzyme activity in control animals: Swiss albino mice 3197.05 ± 163.14
Indian desert gerbil 3306.51 ± 118.91
<table>
<thead>
<tr>
<th>Groups</th>
<th>Number of animals</th>
<th>Nasoanal length (cm)</th>
<th>Incidence of lesions comparable to hepatocellular carcinoma</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Males</td>
</tr>
<tr>
<td>Untreated controls</td>
<td>8 (4♂, 4♀)</td>
<td>9.0 ± 0.66a</td>
<td>0 (0) b</td>
</tr>
<tr>
<td>1.0 μCi/g body weight of Ca⁴⁵</td>
<td>15 (7♂, 8♀)</td>
<td>9.9 ± 0.15</td>
<td>1 (14.28) b</td>
</tr>
<tr>
<td>2.0 μCi/g body weight of Ca⁴⁵</td>
<td>14 (6♂, 8♀)</td>
<td>10.2 ± 0.12</td>
<td>4 (66.6) c</td>
</tr>
</tbody>
</table>

a Standard error.
b Numbers in parentheses, percentage of animals.
c, d Total number of male and female mice respectively.
Fig. 1: Photomicrograph of liver of Swiss albino mice (control) showing normal structure. Note the granular nature of hepatocyttoplasm and uninucleate hepatic cells. Some binucleate cells also seen. Two nucleoli/nucleus are seen. X 400.

Fig. 2: Photomicrograph of liver of Swiss albino mice 1 day after the injection of 1.0 μCi/g body weight of Ca⁴⁵ showing degranulation and vacuolation of hepatocyttoplasm. Some pyknotic nuclei and enucleated cells also seen. The number of binucleated cells is less compared to control. X 400.

Fig. 3: Photomicrograph of liver of Swiss albino mice 1 day after the injection of 2.0 μCi/g body weight of Ca⁴⁵ showing degranulation and vacuolation of hepatocyttoplasm. Many enucleated cells and some pyknotic nuclei are also seen. Hypertrophied Kupffer cells also seen. X 400.

Fig. 4: Photomicrograph of liver of Swiss albino mice 3 days after the injection of 1.0 μCi/g body weight of Ca⁴⁵ showing many pyknotic nuclei and enucleated cells. Increased number of Kupffer cells also seen. X 400.
Fig. 5: Photomicrograph of liver of Swiss albino mice 3 days after the injection of 2.0 μCi/g body weight of Ca⁴⁵ showing degranulated and vacuolated hepatocyttoplasm and numerous pyknotic nuclei. Some enucleated cells are also seen. X 400.

Fig. 6: Photomicrograph of liver of Swiss albino mice 5 days after the injection of 1.0 μCi/g body weight of Ca⁴⁵ showing numerous binucleated cells. Increase in the number of Kupffer cells and lymphocytic infiltration and hyperaemia are also seen. X 400.

Fig. 7: Photomicrograph of liver of Swiss albino mice 5 days after the injection of 2.0 μCi/g body weight of Ca⁴⁵ showing many binucleated cells and hyperaemia and lymphocytic infiltration. Two pyknotic nuclei are also seen. X 400.

Fig. 8: Photomicrograph of liver of Swiss albino mice 7 days after the injection of 1.0 μCi/g body weight of Ca⁴⁵ showing reparative tendencies. Granulation of cytoplasm is apparent but vacuolation of cytoplasm in some cells is seen. Many normal nuclei are also seen. X 400.
Fig. 9: Photomicrograph of liver of Swiss albino mice 7 days after the injection of 2.0 μCi/g body weight of Ca\textsuperscript{45} showing reparative tendencies in some cells. Granulation of hepatocytolasm is apparent. Hypertrophied Kupffer cells and lymphocytic infiltration seen. X 400.

Fig. 10: Photomicrograph of liver of Swiss albino mice 7 days after the injection of 1.0 μCi/g body weight of Ca\textsuperscript{45} showing many binucleated cells and some multinucleated cells. Hypertrophied Kupffer cells are also seen. X 400.

Fig. 11: Photomicrograph of liver of Swiss albino mice 14 days after the injection of 2.0 μCi/g body weight of Ca\textsuperscript{45} showing repair in the form of granular hepatocytolasm normal nuclei. Some multinucleated cells and normal Kupffer cells also seen. X 400.

Fig. 12: Photomicrograph of liver of Swiss albino mice 14 days after the injection of 2.0 μCi/g body weight of Ca\textsuperscript{45} showing mononucleated giant cells. Also seen is one nucleus with fragmented chromatin (karyomeres). X 640.
Fig. 13: Photomicrograph of liver of Swiss albino mice 14 days after the injection of 2.0 μCi/g body weight of Ca⁴⁵ showing normal structure. Note the granular nature of hepatocyttoplasm. X 160.

Fig. 14: Photomicrograph of liver of Swiss albino mice 28 days after the injection of 1.0 μCi/g body weight of Ca⁴⁵ showing relapse of damage in the form of degranulation and vacuolation of hepatocyttoplasm. Many eccentrically placed nuclei, enucleated cells and pyknotic nuclei are also seen. X 100.

Fig. 15: Photomicrograph of liver of Swiss albino mice 28 days after the injection of 1.0 μCi/g body weight of Ca⁴⁵ showing increase in the number of binucleated cells and Kupffer cells. Hyperaemia at some places seen. X 400.

Fig. 16: Photomicrograph of liver of Swiss albino mice 28 days after the injection of 2.0 μCi/g body weight of Ca⁴⁵ showing degranulation and vacuolation of hepatocyttoplasm. Some pyknotic nuclei and enucleated cells are seen. Hypertrophied Kupffer cells also seen. X 400.
Fig. 17: Photomicrograph of liver of Swiss albino mice 165 days after the injection of 1.0 μCi/g body weight of Ca^{45} showing hyperchromatic nuclei with clumped chromatin. Numerous vesicular nuclei with prominent nucleoli also seen. Note the decrease in the binuclearity and Kupffer cells. X 160.

Fig. 18: Photomicrograph of liver of Swiss albino mice 165 days after the injection of 1.0 μCi/g body weight of Ca^{45} showing eosinophilic hepatocyttoplasm. Vesicular nuclei with prominent nucleoli and two hyperchromatic nuclei with clumped chromatin also seen. Very few Kupffer cells seen. X 640.

Fig. 19: Photomicrograph of liver of Swiss albino mice 165 days after the injection of 2.0 μCi/g body weight of Ca^{45} showing eosinophilic hepatocyttoplasm. Many vesicular nuclei with prominent nucleoli and some hyperchromatic nuclei with clumped chromatin are also seen. Note the decrease in the number of binucleated cells. X 160.

Fig. 20: Photomicrograph of liver of Swiss albino mice 165 days after the injection of 2.0 μCi/g body weight of Ca^{45} showing hyperchromatic nuclei with clumped chromatin and large, vesicular nuclei with prominent nucleoli. X 640.
Fig. 21: Photomicrograph of liver of Indian desert gerbil (Meriones hurrianae, Jerdon) (control) showing normal structure. Note the granular nature of hepatocyttoplasm and uninucleate hepatic cells. Some binucleated cells also seen. X 400.

Fig. 22: Photomicrograph of liver of Indian desert gerbil (Meriones hurrianae, Jerdon) 1 day after the injection of 2.0 μCi/g body weight of Ca^{45} showing degranulation and vacuolation of hepatocyttoplasm. Some enucleated cells and pyknotic nuclei are seen. Some cells have eccentrically placed nuclei. Decrease in the number of binucleated cells also seen. X 400.

Fig. 23: Photomicrograph of liver of Indian desert gerbil (Meriones hurrianae, Jerdon) 3 days after the injection of 1.0 μCi/g body weight of Ca^{45} showing many pyknotic nuclei and enucleated cells. Increase in the number of binucleated cells and hypertrophied Kupffer cells also seen. X 400.

Fig. 24: Photomicrograph of liver of Indian desert gerbil (Meriones hurrianae, Jerdon) 3 days after the injection of 2.0 μCi/g body weight of Ca^{45} showing many pyknotic nuclei and binucleated cells. Increase in the number of Kupffer cells also seen. X 400.
Fig. 25: Photomicrograph of liver of Indian desert gerbil (*Meriones hurrianae*, Jerdon) 5 days after the injection of 1.0 µCi/g body weight of Ca⁴⁵ showing pyknotic nuclei and many binucleated cells. Note the decrease in the number of nucleoli/nucleus and lymphocytic infiltration. X 160.

Fig. 26: Photomicrograph of liver of Indian desert gerbil (*Meriones hurrianae*, Jerdon) 5 days after the injection of 2.0 µCi/g body weight of Ca⁴⁵ showing mononucleated and a multinucleated giant cell. Hypertrophied Kupffer cells also seen. X 640.

Fig. 27: Photomicrograph of liver of Indian desert gerbil (*Meriones hurrianae*, Jerdon) 7 days after the injection of 2.0 µCi/g body weight of Ca⁴⁵ showing few enucleated and two pyknotic nuclei. Hypertrophied Kupffer cells, hyperaemia also seen. X 400.

Fig. 28: Photomicrograph of liver of Indian desert gerbil (*Meriones hurrianae*, Jerdon) 7 days after the injection of 2.0 µCi/g body weight of Ca⁴⁵ showing pyknotic nuclei, multinucleated giant cell, multiple nucleoli/nucleus, infiltration of lymphocytes. X 640.
Photomicrograph of liver of Indian desert gerbil (*Meriones hurrianae*, Jerdon) 14 days after the injection of 1.0 μCi/g body weight of Ca⁴⁵ showing granular nature of the hepatocyttoplasm and normal nuclei. Some oedematous cells with enlarged nuclei are seen. Some multinucleated cells are also seen. Some lymphocytic infiltration loci are seen. X 400.

Photomicrograph of liver of Indian desert gerbil (*Meriones hurrianae*, Jerdon) 14 days after the injection of 2.0 μCi/g body weight of Ca⁴⁵ showing granulation of hepatocyttoplasm. Some vacuolation of cytoplasm is visible. A few oedematous cells with enlarged nuclei and many binucleated cells and few multinucleated cells are also seen. X 400.

Photomicrograph of liver of Indian desert gerbil (*Meriones hurrianae*, Jerdon) 14 days after the injection of 1.0 μCi/g body weight of Ca⁴⁵ showing oedematous cells with mononucleated giant cells. Vacuolation of hepatocyttoplasm in many cells is seen. X 400.

Photomicrograph of liver of Indian desert gerbil (*Meriones hurrianae*, Jerdon) 14 days after the injection of 1.0 μCi/g body weight of Ca⁴⁵ showing giant cells. Note the high nuclear/cytoplasmic ratio. X 950.
Fig. 33: Photomicrograph of liver of Indian desert gerbil (*Meriones hurrianae*, Jerdon) 14 days after the injection of 2.0 μCi/g body weight of Ca$^{45}$ showing lymphocytic infiltration and many Kupffer cells. Some cytoplasmic vacuolation and many binucleated cells are seen. X 400.

Fig. 34: Photomicrograph of liver of Indian desert gerbil (*Meriones hurrianae*, Jerdon) 28 days after the injection of 1.0 μCi/g body weight of Ca$^{45}$ showing normal structure. Note the granular hepatocyttoplasm and many uninucleated cells. Some binucleated cells are also seen. X 160.

Fig. 35: Photomicrograph of liver of Indian desert gerbil (*Meriones hurrianae*, Jerdon) 28 days after the injection of 1.0 μCi/g body weight of Ca$^{45}$ showing the normal nuclear and Kupffer cells structure and granular nature of hepatocyttoplasm. X 400.

Fig. 36: Photomicrograph of liver of Indian desert gerbil (*Meriones hurrianae*, Jerdon) 28 days after the injection of 1.0 μCi/g body weight of Ca$^{45}$ showing normal structure. Note the uninucleated condition of hepatic cells and normal Kupffer cells. X 400.
Fig. 37: Histograms showing the percentage of enucleated cells and pyknotic nuclei in the liver of Swiss albino mice after injection of 1.0 and 2.0 μCi/g body weight of Ca⁴⁺. Each value in percentage is an average of six to nine mice ± standard error.
SWISS ALBINO MICE

ENUCLEATED CELL

- 2.0 μCi/g BODY WEIGHT
- 1.0 μCi/g BODY WEIGHT

PERCENTAGE CELLS

DAYS POSTTREATMENT

PYKNOTIC NUCLEI
Fig. 38: Histograms showing the percentage of binucleated and multinucleated cells in the liver of Swiss albino mice after administration of 1.0 and 2.0 $\mu$Ci/g body weight of Ca$^{45}$. Each value in percentage is the average of six to nine mice ± standard error.
SWISS ALBINO MICE

BINUCLEATED CELLS

- 2.0 μCi/G BODY WEIGHT
- 1.0 μCi/G BODY WEIGHT

MULTINUCLEATED CELLS

PERCENTAGE CELLS

DAYS POSTTREATMENT

1 3 5 7 14 28 165 1 3 5 7 14 28 165
Histograms showing the percentage of enucleated cells and pyknotic nuclei in the liver of Indian desert gerbil (*Meriones hurrianae*, Jerdon) after injection of 1.0 and 2.0 $\mu$Ci/g body weight of Ca$^{45}$. Each value in percentage is the average of six to nine gerbils ± standard error.
Fig. 40: Histograms showing the percentage of binucleated and multinucleated cells in the liver of Indian desert gerbil (*Meriones hurrianae*, Jerdon) after injection of 1.0 and 2.0 μCi/g body weight of Ca⁴⁵. Each value in percentage is an average of six to nine gerbils ± standard error.
INDIAN DESERT GERBIL
BINUCLEATED CELLS

2.0 μCi/g body weight
1.0 μCi/g body weight

MULTINUCLEATED CELLS

DAYS POSTTREATMENT

PERCENTAGE CELLS

1 3 5 7 14 28

1 3 5 7 14 28
Fig. 41: Glycogen in the liver of Swiss albino mice on different days after the injection of 1.0 and 2.0 μCi/g body weight of Ca$^{45}$. Each point is the mean of six to nine mice. Data are given as mg glycogen per gram liver. Control values are presented as dotted line (------).
SWISS ALBINO MICE

GLYCOGEN

- - 2.0 μCi/g BODY WEIGHT

- - 1.0 μCi/g BODY WEIGHT

CONTROL

mg GLYCOGEN/G LIVER

1 3 5 7 14 28 165

DAYS POST TREATMENT

41
Fig. 42: Phosphorylase (glycogen degradative) activity in the liver of Swiss albino mice on different days after the injection of 1.0 and 2.0 μCi/g body weight of Ca$^{45}$. Control values are presented as dotted line (-----). Data are given as mg glucose formed per gram liver and are the average of six to nine mice.
SWISS ALBINO MICE
PHOSPHORYLASE (GLYCOGEN DEGRADATIVE)
- 2.0 μCi / G BODY WEIGHT
- 1.0 μCi / G BODY WEIGHT

mg GLUCOSE FORMED / G LIVER

DAYS POSTTREATMENT
Fig. 43: Activity of phosphorylase (glycogen synthesis) in the liver of Swiss albino mice after the injection of 1.0 and 2.0 μCi/g body weight of Ca^{45} on different days. Control values are presented as dotted line (-----). Data are given as mM phosphate (Pi) formed per gram liver and are the average of six to nine mice.
SWISS ALBINO MICE

PHOSPHORYLASE (GLYCOGEN SYNTHESISING)

- ○ 2.0 μCi/G BODY WEIGHT
- ▲ 1.0 μCi/G BODY WEIGHT

mM PHOSPHATE FORMED / G LIVER

DAYS POSTTREATMENT

CONTROL
Fig. 44: Glucose-6-phosphatase activity in the liver of Swiss albino mice on different days after the injection of 1.0 and 2.0 μCi/g body weight of Ca⁴⁵. Control values are presented as dotted line (-----). Data are given as mM phosphate (Pi) formed per gram liver and are the average of six to nine mice.
SWISS ALBINO MICE

GLUCOSE-6-PHOSPHATASE

- 2.0 μCi/g BODY WEIGHT
- 1.0 μCi/g BODY WEIGHT

mM PHOSPHATE FORMED/G LIVER

DAYS POSTTREATMENT
Fig. 45: Phosphohexose isomerase activity in the liver of Swiss albino mice on different days after the injection of 1.0 and 2.0 μCi/g body weight of Ca$^{45}$. Data are given as μg fructose formed per gram liver and are the average of six to nine mice. Control values are presented as dotted line (-----).
SWISS ALBINO MICE

PHOSPHOHEXOSE ISOMERASE

○ ○ 2.0 μCi/G BODY WEIGHT
△ △ 1.0 μCi/G BODY WEIGHT

μG FRUCTOSE FORMED/G LIVER

DAYS POSTTREATMENT
Fig. 46: Glutamate pyruvate transaminase (GPT) activity in the liver of Swiss albino mice on different days after the injection of 1.0 and 2.0 μCi/g body weight of Ca⁴⁵. Data are given as mm sodium pyruvate formed per gram liver and are the average of six to nine mice. Control values are presented as dotted line (----).
SWISS ALBINO MICE

GLUTAMATE PYRUVATE TRANSAMINASE

- - 2.0 μCi/G BODY WEIGHT
- - - 1.0 μCi/G BODY WEIGHT

mM SODIUM PYRUVATE FORMED/G LIVER

DAYS POSTTREATMENT
Fig. 47: Glutamate oxalacetate transaminase (GOT) activity in the liver of Swiss albino mice on different days after 1.0 and 2.0 μCi/g body weight of Ca⁴⁵. Data are given as mM sodium pyruvate formed per gram liver and are the average of six to nine mice. Control values are presented as dotted line (----).
SWISS ALBINO MICE

GLUTAMATE OXALACETATE TRANSAMINASE

○○ 2.0 μCi/G BODY WEIGHT
△△ 1.0 μCi/G BODY WEIGHT

mM SODIUM PYRUVATE FORMED / LIVER

DAYS POSTTREATMENT

POSTTREATMENT
Fig. 48: Activity of acid phosphatase (AcP) in the liver of Swiss albino mice on different days after the injection of 1.0 and 2.0 μCi/g body weight of Ca⁴⁵. Data are given as μg phosphate (P1) formed per gram liver and are the average of six to nine mice. Control values are presented as dotted line (- - - - -).
SWISS ALBINO MICE

ACID PHOSPHATASE

- 2.0 µCi/G BODY WEIGHT

- 1.0 µCi/G BODY WEIGHT

µG PHOSPHATE FORMED/G LIVER

DAYS POSTTREATMENT

1 3 5 7 14 28 165

CONTROL
Fig. 49: Activity of alkaline phosphatase (Al) in the liver of Swiss albino mice on different days after the injection of 1.0 and 2.0 µCi/g body weight of Ca$^{45}$. Data are given as µg phosphate (Pi) formed per gram liver and are the average of six to nine mice. Control values are presented as dotted line (----).
SWISS ALBINO MICE

ALKALINE PHOSPHATASE

○ ○ 2.0 µCi/g BODY WEIGHT
△ △ 1.0 µCi/g BODY WEIGHT

µg PHOSPHATE FORMED/G LIVER

1000
2000
3000
4000
5000
6000
7000

DAYS POSTTREATMENT

1 3 5 7 14 28 165

CONTROL
Fig. 50: Glycogen in the liver of Indian desert gerbil (*Meriones hurrianae*, Jerdon) on different days after the injection of 1.0 and 2.0 μCi/g body weight of Ca⁴⁵. Data are given as mg glycogen per gram liver and are the mean of six to nine gerbils. Control values are presented as dotted line (-----).
Indian Desert Gerbil

Glycogen

- O 2.0 μCi/g body weight
- △ 1.0 μCi/g body weight

Control

DAYS POSTTREATMENT

mg glycogen g/liver

1 3 5 7 14 28
Fig. 51: Phosphorylase (glycogen degradative) activity in the liver of Indian desert gerbil (Meriones hurrianae, Jerdon) on different days after the injection of 1.0 and 2.0 μCi/g body weight of Ca⁴⁵. Data are given as mg glucose formed per gram liver and are the average of six to nine gerbils. Control values are presented as dotted line (-----).
INDIAN DESERT GERBIL

PHOSPHORYLASE (GLYCOGEN DEGRADATIVE)

- ○ 2.0 $\mu$Ci/G BODY WEIGHT
- ▲ 1.0 $\mu$Ci/G BODY WEIGHT

mg GLUCOSE FORMED/G LIVER

DAYS POSTTREATMENT
Fig. 52: Activity of phosphorylase (glycogen synthesis) in the liver of Indian desert gerbil (*Meriones hurrianae*, Jerdon) on different days after the injection of 1.0 and 2.0 µCi/g body weight of Ca⁴⁵. Data are given as µg phosphate (Pi) formed per gram liver and are the average of six to nine gerbils. Control values are presented as dotted line (----).
INDIAN DESERT GERBIL

PHOSPHORYLASE (GLYCOGEN SYNTHESISING)

- 2.0 μCi/G BODY WEIGHT
- 1.0 μCi/G BODY WEIGHT

mM PHOSPHATE FORMED / G LIVER vs DAYS POSTTREATMENT
Fig. 53: Glucose-6-phosphatase (G-6-Pase) activity in the liver of Indian desert gerbil (*Meriones hurrianae*, Jerdon) on different days after the injection of 1.0 and 2.0 μCi/g body weight of Ca⁴⁺. Data are given as μmoles phosphate (Pi) formed per gram liver and are the average of six to nine gerbils. Control values are presented as dotted line (-----).
INDIAN DESERT GERBIL

GLUCOSE-6-PHOSPHATASE

- O 2.0 μCi/g BODY WEIGHT
- Δ 1.0 μCi/g BODY WEIGHT

mM PHOSPHATE FORMED G/LIVER

1 3 5 7 14 28

DAYS POSTTREATMENT
Fig. 54: Phosphohexose isomerase (FHI) activity in the liver of Indian desert gerbil (*Meriones hurrianae*, Jerdon) on different days after the injection of 1.0 and 2.0 μCi/g body weight of Ca⁴⁵⁺. Data are given as μg fructose formed per gram liver and are the average of six to nine gerbils. Control values are presented as dotted line (-----).
INDIAN DESERT GERBIL
PHOSPHOHEXOSE ISOMERASE

- 2.0 μCi/g BODY WEIGHT
- 1.0 μCi/g BODY WEIGHT

μG FRUCTOSE FORMED/G LIVER

DAYS POSTTREATMENT
Fig. 55: Glutamate pyruvate transaminase (GPT) activity in the liver of Indian desert gerbil (*Meriones hurrianae*, Jerdon) on different days after the injection of 1.0 and 2.0 μCi/g body weight of Ca⁴⁵. Data are given as mM sodium pyruvate formed per gram liver and are the average of six to nine gerbils. Control values are presented as dotted line (-----).
INDIAN DESERT GERBIL

GLUTAMATE PYRUVATE TRANSAMINASE

- 2.0 μCi / G BODY WEIGHT
- 1.0 μCi / G BODY WEIGHT

140
120
100
80
60
40
20
0

mM SODIUM PYRUVATE FORMED / G LIVER

CONTROL

DAYS POSTTREATMENT
Fig. 56: Glutamate oxalacetate transaminase (GOT) activity in the liver of Indian desert gerbil (Meriones hurrianae, Jerdon) on different days after the injection of 1.0 and 2.0 μCi/g body weight of Ca⁴⁵. Data are given as mm sodium pyruvate formed per gram liver and are the average of six to nine gerbils. Control values are presented as dotted line (----).
INDIAN DESERT GERBIL

GLUTAMATE OXALACETATE/TRANSAMINASE

- ○ 2.0 μCi/G BODY WEIGHT
- ▲ 1.0 μCi/G BODY WEIGHT

mM SODIUM PYRUVATE FORMED/G LIVER

DAYS POSTTREATMENT

1 3 5 7 14 28
Fig. 57: Acid phosphatase (AcP) activity in the liver of Indian desert gerbil (Meriones hurrianae, Jerdon) on different days after the injection of 1.0 and 2.0 μCi/g body weight of Ca⁴⁵⁺. Data are given as μg phosphate (Pi) formed per gram liver and are the average of six to nine gerbils. Control values are presented as dotted line (----).
INDIAN DESERT GERBIL

ACID PHOSPHATASE

○ ○ 2.0 μCi/g BODY WEIGHT
△ △ 1.0 μCi/g BODY WEIGHT

μG PHOSPHATE FORMED/G LIVER

DAYS POSTTREATMENT

CONTROL
Fig. 58: Activity of alkaline phosphatase (Al) in the liver of Indian desert gerbil (Meriones hurrianae, Jerdon) on different days after the injection of 1.0 and 2.0 μCi/g body weight of Ca⁴⁵. Data are given as μg phosphate (Pi) formed per gram liver and are the average of six to nine gerbils. Control values are presented as dotted line (-----).
INDIAN DESERT GERBIL

ALKALINE PHOSPHATASE

2.0 μCi/G BODY WEIGHT

1.0 μCi/G BODY WEIGHT

DAYS POSTTREATMENT

μG PHOSPHATE FORMED / G LIVER

3200

CONTROL

3 5 7 14 28