the same symptoms but in a gradual way; the animal dies after five or six hours. A dose of between 3 and 4 grams causes no serious effects, but for six or eight hours after its administration the animal remains in a soporous state; it sits in one place with eyes closed and head drooping; a loud noise wakes it up and it attempts to move about or to eat, but in a few minutes it falls asleep again.

This toxicity of the magnesium nitrate is apparently due to its greater absorption from the gastro-intestinal canal. It is certainly not due to its diminished elimination through the kidneys; on the contrary it acts in some degree as a diuretic, and, when given by subcutaneous injection, the animal withstands a somewhat greater proportionate dose of the nitrate than of the sulphate or chloride, probably because the nitrate increases somewhat the diuresis. As to the share which the anion, the nitrate end of the compound, may have in the toxic effect, I do not wish to make a positive statement; but I doubt whether it is of any importance. I studied the toxic effects of sodium nitrate administered by mouth and compared the manifestations with those seen after administration of magnesium nitrate; the contrast was sharp. Even with a dose of 12 grams of the sodium nitrate per kilo there is never such an anesthesia or paralysis as that caused by the magnesium salts; on the contrary the animal is all excitement and restlessness. Besides, the late death of the animal after administration of sodium nitrate is due to circulatory disturbances, whereas after poisoning with magnesium salts, the animal dies of respiratory paralysis.

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On the promoting influence of heated tumor emulsions on tumor growth.

By **SIMON FLEXNER** and **J. W. JOBLING.**

[*From the Rockefeller Institute for Medical Research.*]

We have on several occasions presented to this Society some of the results of the study of a transplantable sarcoma of the rat, and we wish to-day to record an effect on the growth of the tumor which is produced by inoculation of the rats with an emulsion of the tumor cells, previously heated for half an hour to 56° C. This

emulsion was injected into the peritoneal cavity and the fragments of living tumor are introduced beneath the skin. The promoting effect on the growth of the tumor fragments to be described became evident in several sets of experiments in which the same emulsion (unheated), blood serum, bouillon, salt and Ringer solutions were injected in the same manner, with which substances this promoting effect was not obtained. If the inoculation of the fragment of the tumor is made twenty four hours after the injection of the unheated emulsion, no difference is noted between the control rats, the rats injected with the other substances, and those injected with heated emulsion. But if the fragments are inoculated ten or more days (up to thirty days) later, then the number of tumors which develop in the rats receiving the heated emulsion tends to exceed the controls and the other series mentioned; they grow with greater rapidity so as to reach double the size of the controls or even a still greater size, and show a far smaller percentage of recoveries (retrogressions). This promoting influence is present, as stated, on the tenth day after inoculation, and indications exist tending to show that it is less effective at the expiration of thirty days. On the other hand, indications also exist tending to show that if the injections of heated emulsion are repeated once or twice at ten-day intervals, the conditions of the animal favoring the growth and persistence of the tumors can be maintained and possibly even still further increased.

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On the chemical inactivation and regeneration of complement.

By **HIDEYO NOGUCHI.**

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The complementary substances of an active serum were supposed to be extremely labile bodies, but their stability has never been tested chemically. In this study, the action of various acids, alkalies and salts upon complements has been examined. The list of chemicals used is as follows: ACIDS — hydrochloric, nitric, sulphuric, phosphoric, formic, acetic, propionic, lactic, butyric, oxybutyric, oxalic, tartaric, citric, fumaric, maleinic, citraconic, itaconic, glycerophosphoric, uric and nucleic; ALKALIES — am-