

(Dochez N. Y. 5). Reinoculation subcutaneously with 5 cc. of the unfiltered scarlatinal exudate one month after the first inoculation produced a diffuse and mild erythema in 2 rabbits previously injected with the unfiltered scarlatinal exudate. While the Dick test remained negative in all other rabbits these 2 rabbits reacted strongly with 40 skin test doses of the toxin. Neutralization of these reactions with scarlet fever antitoxin was inconclusive. The changes in temperature, number of leucocytes and differential blood picture during the erythematous phase were not remarkable from that observed in the non-reacting animals. The blood cultures remained consistently negative. *Monkeys*: Thirty monkeys (*Macacus rhesus*) were placed at our disposal by the kind permission of Dr. G. W. Corner. Each animal was injected subcutaneously with 4 cc. of the whole scarlatinal faucial exudate. Nothing remarkable was observed in any one animal during one month's observation except local swelling and slight redness at the site of inoculation, which cleared up rapidly without abscess formation.

Conclusions. Sterile filtrates of scarlatinal faucial exudations failed to produce the scarlatinal syndrome in guinea pigs and rabbits. Subcutaneous inoculation of the unfiltered scarlatinal faucial exudations into guinea pigs and rabbits produced irregularly an erythema suggestive of scarlet fever, without any remarkable changes in temperature, leucocytic cell count or differential blood picture. Development of marked skin sensitivity to the Dick toxin following the injection of scarlatinal exudations suggested an allergic basis for the suggestive scarlatinal rash which was followed by desquamation. Monkeys remained entirely refractory to the scarlatinal faucial exudations. A filterable virus in scarlatinal faucial exudations capable of producing the scarlatinal syndrome in guinea pigs and rabbits was not demonstrable.

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Effect of Epinephrine on the Oxygen Consumption of Frogs Before and After Hepatectomy.

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It has been shown that epinephrine injections in physiological doses liberate lactic acid in muscle. From the work of Meyerhof it is known that an increased formation of lactic acid in muscle is

followed by increased respiration. The calorogenic action of epinephrine is ascribed to the extra expenditure of energy required in the reconversion of lactic acid to glycogen. This conception raises the following 2 questions: 1. In what tissues is the reconversion of lactic acid taking place? 2. What is the efficiency of the reconversion process? The present experiments deal mainly with the first question.

Frogs were used with the central nervous system destroyed with the exception of the medulla oblongata. Such animals are able to breathe spontaneously but otherwise they are completely immobilized. Oxygen consumption (at 15° C.) was determined by connecting glass vessels, in which the frogs were placed, with Warburg manometers, the CO₂ being absorbed by KOH. Table I shows that

TABLE I.
Influence of epinephrine on O₂ consumption of immobilized frogs.

No. of experiments	cc. O ₂ per kilo of frog per hour at 15° C.					% increase in O ₂ over average basal	
	Basal			Epinephrine		1st hr.	2nd hr.
	1st hr.	2nd hr.	Saline	1st hr.	2nd hr.		
11; controls	32.8	31.7	35.1	50.2	44.2	51.2	33.1
6; 1st day after hepatectomy	27.7	27.5	30.0	42.9	32.0	51.0	12.7
4; 2nd day after	27.9	28.5	29.6	38.6	32.4	35.0	13.3
3; 3rd day after	25.7	26.3	—	32.8	30.1	26.4	15.8
2; 4th day after	26.9	25.8	—	33.7	29.7	28.2	12.9

the average oxygen consumption during 2 basal hourly periods is of practically the same magnitude. After the second basal hour the frogs were removed from their containers and injected with salt solution in order to test the effect of an injection. A slight increase in O₂ consumption was noted. A subsequent injection of 0.05 to 0.1 mg. of epinephrine into a lymph sack was followed by a marked rise in O₂ consumption, lasting for 2 hours. This result dispels the notion held by some investigators, that the increased O₂ consumption after epinephrine injection is of central origin and is due to the hyperactivity of the animal.

The immobilized frogs were hepatectomized. A calorogenic effect of epinephrine, nearly as marked as in frogs with intact liver, was obtained on the first day after hepatectomy. On the second, third and fourth day after removal of the liver the calorogenic effect was less marked and in some individual experiments it disappeared entirely a few hours before death of the animal.

In the frog it has been shown that lactic acid added to the per-

fusion fluid of muscle is converted to glycogen (Meyerhof *et al.*¹) and indeed an increased oxygen consumption occurs in the tissues of the hepatectomized frog after epinephrine injection, an effect which is ascribed to the reconversion of lactic acid. In mammals a large part of the lactic acid formed in muscle under the influence of epinephrine is reconverted to glycogen in the liver.² Whether or not a calorogenic effect of epinephrine can still be obtained in mammals after removal of the liver has not been decided with certainty; some of the negative results recorded in the literature may have been due to the rapidly approaching end of the animal and not to the removal of the liver. Nor is there definite evidence available as to whether or not blood lactic acid can be converted to glycogen in mammalian muscle.

In frogs kept anaerobically more lactic acid is formed under the influence of epinephrine than in frogs under aerobic conditions.³ This may be interpreted in the sense that the Pasteur reaction (*i. e.*, the effect of respiration on lactic acid formation) is not particularly disturbed during epinephrine action but a definite conclusion is withheld until the efficiency of the reconversion process has actually been determined.

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Low Power Ultraviolet Lamps and the Control of Rickets.

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In experiments commenced in April, 1929, and recently completed, tests have been made of the antirachitic value of the ultraviolet emitted by tungsten filaments similar to those used in ordinary electric light bulbs. To secure any appreciable amount of therapeutic rays from such sources, bulbs made of the very best ultraviolet transmitting glass must be used. The Corex D bulbs in the lamps employed in these experiments transmit about three-fourths of the vital ultraviolet given off from the filament. Such lamps, at present provided only for experimental purposes, are designated by their producers, the General Electric Company, as CX lamps.

¹ Meyerhof, O., Lohman, K., and Meyer, R., *Biochem. Z.*, 1925, **157**, 459.

² Cori, C. F., and Cori, G. T., *J. Biol. Chem.*, 1928, **79**, 309.

³ Cori, C. F., and Buchwald, K. W., *J. Biol. Chem.*, 1930, **87**, *Proc.* **88**.