TABLE II. Ratio of Number of Cells Transformed to Streptomycin (SM) Resistant by Heterologous "Species" DNA_{SM} to Number Transformed by Homologous Species DNA_{SM}. Range of ratio for homologous species transformation included for comparison.

Recipient species and strain		Hemophilus species source of transforming factor (DNA_{SM})		
		H. influenzae	*H. aegyptius*	*H. parainfluenzae*
H. influenzae	Rd	(.3 to 1)*	.6 to 1	.003 (.002 to .004)*
	Rb	(.2 to .8)*	.4 to .7	.012 (.007 to .008)*
	3	(.1 to >1)*	.7 to >1	.002 to .009
	4	(.3 to .6)*	.4 to .6	.017 (.016 to .02)*
H. aegyptius	46	.6		
	181a	.3 to 1	.3 to 1	.003 to .006
	15	.2 to 1	.3 to .8	.02 to .07
H. parainfluenzae	1	.002 (.003–.004)*	.003 to .007	(.1 to .5)*
	7	.006	.003 to .009	(.3 to 1)*

* Figures in parentheses obtained from published data(4).

cipient population of *H. influenzae* or *H. aegyptius* are exposed simultaneously to DNA's derived from streptomycin (SM)-resistant cells of the same strain or from different *H. influenzae* and *H. aegyptius* strains, the proportion of cells in which SM-resistance is induced is of the same order of magnitude. The results obtained are comparable to those found in intraspecific transformation(4). On the other hand, the proportion of cells of either *H. influenzae* or *H. aegyptius* transformed to SM-resistant by the DNA from *H. parainfluenzae* is in the range expected in interspecific transformation (4).

Summary. On the premise that the degree of reactivity of donor DNA with the heredity determinants of the recipient cell is a reflection of the degree of homology of the genome of donor and recipient cells, it has been proposed that transformation may serve as a valid criterion for bacterial taxonomy. If the use of a single genetic marker, SM-resistance, provides a valid basis for comparison, *H. aegyptius* may be a member of the *H. influenzae* group.

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Effect of Certain Tranquilizers on The Reticulo Endothelial System. (25152)

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Several investigators observed that administration of reserpine or chlorpromazine lowered the resistance of patients to infectious diseases(7,9). Grosz and Norton(4) reported that chlorpromazine increased the susceptibility of mice to infection with *Salmonella enteritidis*. Meier *et al.*(8) showed that chlorpromazine depressed the phagocytic action of the reticulo endothelial system (RES) whereas mepazine (N-methyl-piperidyl-1,3-methyl phenothiazine) did not have this action. It was of interest to study the effect of several tranquilizers on the RES in greater detail and to carry out experiments relating to their mode of action.

Methods. Measurement of RES activity was accomplished by determining blood clearance of carbon particles (india ink, Gunther-Wagner, Hanover, Germany C11/1431A) as outlined by Heller *et al*(5). Average particle

TABLE I. Effect of Tranquilizers on Clearance Rate of Carbon Particles in Blood of Mice. T/2 is time in minutes needed to reduce initial carbon level to one half.

Drug	Dose, mg/kg	Control: No. of animals	Control: T/2 ± S.E.	Drug: No. of animals	Drug: T/2 ± S.E.	T/2 as % of control	P value
Chlorpromazine	5	5	22.3 ± 3.6	5	19.5 ± 1.8	87.4	.5
	20	9	21.1 ± 2.1	8	29.6 ± 2.5	140.3	.02
Hydroxyzine	50	5	22.3 ± 3.6	6	19.0 ± 1.9	85.4	.4
	100	9	21.1 ± 2.1	9	33.3 ± 2.8	152.6	.001
Meprobamate	"	6	21.3 ± 2.0	6	23.7 ± 2.7	111.1	.5
	200	5	22.3 ± 3.6	5	" ± 2.9	106.3	.8
Phenaglycodol	100	9	21.1 ± 2.1	9	27.3 ± 1.6	129.2	.02
	200	5	22.3 ± 3.6	5	46.0 ± 2.9	206.1	.001
Reserpine	1	5	" ± "	6	23.7 ± 3.2	106.3	.8
	10	9	21.1 ± 2.1	8	46.1 ± 6.4	218.4	.001

size in this suspension is about 200 A. Male CF1 mice weighing 20 to 22 g were used as experimental animals. Tranquilizers were given intraperitoneally. Chlorpromazine, hydroxyzine and pentobarbital were dissolved in saline. Meprobamate was given as a supersaturated solution in saline. The volume given was 0.5 ml/20 g mouse. Reserpine and phenaglycodol were dissolved in minimum amount of propylene glycol. Most drugs were injected at 2 different dose levels. Carbon suspension was injected intravenously 24 hours after administration of drugs in a dose of 200 mg/kg in a 0.2 ml volume/20 g mouse. Blood samples were obtained from the tail 8, 15 and 22 minutes after administration of carbon suspension. Each 0.005 ml blood sample was diluted with 0.6 ml of 0.01 M sodium carbonate and the optical density determined on Bausch and Lomb spectrophotometer at 600 mμ. At least 6 animals were used for each determination. Density values for each experimental animal were plotted on semi-logarithmic paper and the half life of carbon clearance determined. Average half time and its standard error were then computed. A control group receiving saline was performed with each experiment. Adrenalectomy was carried out under ether by the dorsal approach. Animals were given one week to recover and received a 1% NaCl solution in place of drinking water.

Results. Chlorpromazine, hydroxyzine and reserpine did not significantly affect the clearing rate at low doses but markedly slowed clearing of carbon particles from the blood stream in high doses. Phenaglycodol had a slight but significant effect at lower dose and produced a striking delay of clearing at higher dose. The only tranquilizer that did not affect the clearing rate was meprobamate. These results are shown in Table I.

It is known that chlorpromazine stimulates release of corticotropin from the anterior pituitary(3) and that corticosteroids inhibit clearing of carbon particles by the RES(6,2). From these facts it appeared possible that tranquilizers which delay clearing, do so by stimulating secretion of corticosteroids. To investigate this possibility clearing rates in adrenalectomized animals were studied.

Adrenalectomized animals did not tolerate the large doses of chlorpromazine and reserpine that had to be given to retard clearing. The animals died within 24 hours after administration of the drugs. Adrenalectomized animals receiving hydroxyzine tolerated the drug and could be used for this study. Results of an experiment are shown in Table II. Adrenalectomy does not affect clearing, as previously reported(1). Hydroxyzine in untreated animals delayed clearing but clearing was unaffected in drug-treated adrenalectomized animals. Sham-operated animals treated with hydroxyzine showed a significant delay in clearing rate.

Discussion. The results here reported indicate that certain tranquilizers when given in large doses have a depressant action on the reticulo endothelial system. This is apparently due to a stimulant effect of these drugs on secretion of corticosteroid hormones by the adrenal gland. It is possible that the increased

TABLE II. Effect of Adrenalectomy on Carbon Clearance of Mice Treated with Hydroxyzine.

Treatment	Dose, mg/kg	No. of animals	T/2 ± S.E.	P value
A. Normal, saline		9	27.0 ± 2.6	
B. Adrenalectomy, saline		9	24.9 ± 2.5	.6
C. Normal, hydroxyzine	100	10	59.6 ±10.7	.01
D. Adrenalectomy, hydroxyzine	"	9	25.1 ± 2.2	.6
E. Sham operation, hydroxyzine	"	9	39.5 ± 3.5	.01

susceptibility to infections as well as certain other side effects observed after administration of large doses of certain tranquilizers, may be due to an excess of steroid hormones in the body. However, the data presented here indicate that tranquilizers given in the usual clinical doses would not be likely to affect the reticulo endothelial system.

Several tranquilizers when given in large doses produced a marked depression of the central nervous system, manifested by deep sedation and loss of the righting reflex. The possibility that this central nervous system depression may affect phagocytic activity of the reticulo endothelial system was tested by determining clearance rates in animals treated with pentobarbital 50 mg/kg and amobarbital 140 mg/kg. These hypnotics which produced deep central nervous system depression with loss of righting reflex did not inhibit phagocytic activity of the reticulo endothelial system.

Summary. Administration of excessive doses of certain tranquilizers decreased the phagocytic activity of the reticulo endothelial system. This decrease of phagocytic activity did not occur in adrenalectomized animals given hydroxyzine. The significance of this finding is discussed in relation to the strong RES inhibition produced by corticosteroids (6,2).

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Serum Lipid Analyses in Rats Fed Natural and Hydrogenated Cottonseed Oil with Cholesterol and Cholate.* (25153)

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In a recent study we recorded some measurements of rat blood lipid concentrations when dietary cholesterol was present or absent in rations with varying degrees of saturation of vegetable fats(1). The results indicated that serum cholesterol is raised by increasing saturation of dietary lipids and that dietary cholesterol augments this effect for more saturated fats. In this experiment, we extended our observations to include lipoproteins and fatty acid compositions of serum cholesterol esters when saturated (hydroge-

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