distributed among individual cells of a suspension than is lactate medium. To explore this idea further studies with fluorescein-labeled antibody are in progress.

Summary. With 3 strains of influenza virus formation of non-infectious cell-associated hemagglutinins in Krebs 2 ascites cells was much greater in a medium containing lactate and glutamine than when glucose was substituted for lactate. Reduction in tumor-producing capacity of cell suspensions by action of influenza virus was correlated with the effect of substrate on HA formation. A marked oncolytic effect was evident in lactate medium at 4 hours, or before the increase in HA. Although Newcastle disease virus was oncolytic at the same concentration as influenza, growth of NDV and its action on tumor-producing capacity were not affected by the substrate.

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Importance of Particle Size in Aerosol Therapy.* (25688)

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It is known that retention of airborne particulate matter in the respiratory tract is chiefly influenced by size of particles inhaled; the large particles settle in the tracheobronchial tree and smaller ones penetrate deeper into the lungs. When smaller than 0.5 μ in diameter, particles are nearly exclusively deposited upon walls of alveolar ducts and alveolar sacs(1). To emphasize the importance of particle size in administration of medicated aerosols, a small series of experiments was undertaken using 2 different sources of airborne particles: a standard nebulizer (commercially available) producing particles ranging from 0.8 to 7.4 μ, averaging 3.1 μ, according to Grau(2) or from 1.6 to 14.8 μ averaging 6.2 μ according to Barach(3) as measured by optical microscopy and an aerosol generator called D-30, previously described(1) producing particles all below 0.5 μ diameter as measured by electron microscopy. Medicated aerosol was produced from a solution containing 0.1% isoproterenol, 2% phenylephrine in medium composed of equal parts of USP propylene glycol and water. At 5 p.s.i. head pressure the standard nebulizer delivered 9 g of this solution in 10 minutes while the D-30 aerosol generator, during same time and same pressure, delivered 0.3 g only. Four normal subjects (30, 32, 45 and 65 years in age) breathed the medicated dispersates alternately as produced by standard nebulizer and by aerosol generator, duration of inhalation varying from 5 to 20 slow, deep, sub-maximal breaths. Airway resistance was measured according to plethysmographic method of DuBois, Botelho and Comroe(4), and blood pressure, heart rate, and electrocardiogram were recorded in serial fashion.

Results were as follows: 1. Airway resis-

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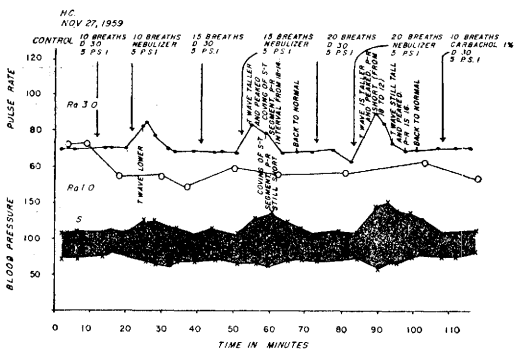

FIG. 1. A representative experiment showing effects of sympathomimetic drug on blood pressure (shaded area), airway resistance (open circles) and heart rate (solid circles). Blood pressure and pulse rate remained stable except after breathing aerosol produced by standard nebulizer.

tance was decreased from control value in every instance on first administration of drug by either standard nebulizer or D-30 generator. Thereafter, it remained below control level. 2. Inhalation of drug dispersed by standard nebulizer always induced changes in heart rate and a rise in blood pressure.

(a) Breathing 5 to 7 breaths of the medicated dispersate from standard nebulizer did not produce subjective symptoms in any subjects, although changes in blood pressure were noticed (Table I, Fig. 1). (b) In 3 out of 4 subjects, rise of blood pressure was accompanied by tachycardia, while in the 4th subject bradycardia was observed during peak of blood pressure elevation (Table I). 3. Every subject noted either a retrosternal dull sensation after 10 breaths of the medicated dispersate from commercial nebulizer or, after 15 breaths, palpitations, retrosternal pain, and/or headache. 4. Inhalation of the aerosol produced by D-30 generator did not cause significant change in parameters under study (Table I, Fig. 1). 5. Following inhalation of 10, 15, or 20 breaths of the medicated dispersate from standard nebulizer, the T wave was either flattened or taller than in control conditions. The ECG remained unchanged while breathing the medicated aerosol from the D-30 generator even after 20 breaths were taken. 6. Duration of changes observed after breathing the medicated dispersate from standard nebulizer was proportional to number of breaths taken. Following 20 breaths, blood pressure changes were noticeable up to 20 minutes after end of inhalation.

Summary. Comparison of effects of 2 aerosols of the same sympathomimetic drug was made. Administration in the usual therapeutic amount of 1 aerosol produced by standard, commercially available, nebulizer caused tachycardia and blood pressure elevation in 4 normal subjects. The other aerosol from a D-30 generator which previously had been shown to relieve bronchoconstriction (5), when breathed in the same manner, failed to have systemic effects. Lack of undesirable side ef-

TABLE I. Individual Values of Blood Pressure (mm Hg), Pulse Rate, and Airway Resistance (cm H_2O/l/sec.) after Inhalation of a Sympathomimetic Aerosol Dispersed by a Commercial Nebulizer or by a D-30 Generator.

			5-10 breaths		15 breaths		20 breaths	
		Control	D-30	Nebulizer	D-30	Nebulizer	D-30	Nebulizer
F.L.	B.P.	120/84	120/84	138/84	126/86	148/88	129/90	148/92
	Pulse	87	88	90	83	100	83	104
	R_A	2.2	1.7	1.7	1.4	1.7	1.3	1.7
H.C.	B.P.	110/75	116/82	124/66	118/70	134/66	112/72	148/66
	Pulse	70	70	82	68	83	71	90
	R_A	2.7	1.8	1.8	2.0	1.8	1.8	2.1
A.S.	B.P.	136/76	138/70	160/70	138/80	184/74	150/84	176/88
	Pulse	91	85	94	85	105	88	106
	R_A	1.2	.5	1.0	.4	.2	.3	.4
L.D.	B.P.	142/84	156/80	196/92	166/86	230/96		
	Pulse	70	65	65	62	54		
	R_A	2.6	1.3	1.4	1.4	1.2		
Avg	B.P.	127/80	133/79	155/78	137/81	174/80		
	Pulse	80	77	83	74	86*		
	R_A	2.1	1.3	1.4	1.3	1.2		

* Note bradycardia in subject L.D.

fects from the latter was presumably due to submicroscopic particles emanating from the D-30 generator. They produced a larger surface area to dose ratio and were able to reach areas in the lung where they are locally most effective even though total dose from generator was 30 times less than from the standard nebulizer for a given number of breaths.

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Chilomastix mesnili Encystment *in vitro.** (25689)

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Unlike amebas, which undergo encystment both spontaneously and by inducement *in vitro,* intestinal flagellates seldom exhibited cysts in culture. Although Boeck(1) was the first to cultivate *Chilomastix mesnili* trophozoites in an artificial medium and later other investigators agreed, it was not until 1928 that da Cunha and Muniz(2) observed encystment of this organism in blood agar and N.N.N. mediums. Ball(3), however, failed to confirm their results and also failed to produce cysts in a variety of mediums. In the present investigation 9 stool specimens cultured on a diphasic charcoal medium(4) yielded numerous cysts in addition to trophozoites of *C. mesnili.* They were designated as shown in Table I.

TABLE I. Comparison of Stool Findings and Ameba Culture Findings—*C. mesnili.*

Year	Specimen(s)	Stool examination	Cyst findings in culture
1958	3455	No organisms seen	Numerous
1959	1734, 1740*	Trophozoites only	"
	1971, 1972*	*Idem*	"
	2446, 2451*	Many trophozoites, few cysts	"
	3502	Trophozoites only	"
	3677*	*Idem*	"
	3916*	"	"
	6391	No organisms seen	"
	6413	Few cysts only	"

* Purged patients.

Cyst production was indicated clearly by numerous cysts observed in cultures. Often the cysts were clumped. In 2 instances neither cysts nor trophozoites were seen in stool specimens, but the cultures yielded many trophozoites and cysts.

There was no attempt to isolate any of these strains of *C. mesnili* for further study to determine continuance of cyst production in stock cultures.

Summary. Encystment of *Chilomastix mesnili* was observed in cultures of 9 stool specimens which had been placed in a diphasic charcoal medium.

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