Arterial blood examination (table 1) showed a fall in pO_2 and O_2 saturation, and an increase in the alveolar-arterial oxygen pressure difference. Chloramphenicol (chloromycetin®) was started on September 19 because of an infection of the upper respiratory tract, and ACTH therapy was started on September 27 (table 1). Subsequent measurements of lung function showed a rather marked increase in maximum breathing and a slight increase in vital capacity. Exercise tolerance improved, and the patient no longer required intermittent oxygen therapy. However, she still had visible cyanosis.

Cortisone was administered in the period between October 6 and 18 but apparently produced little additional improvement.

The eosinophil count showed a good fall, and 17-ketosteroids excretion was significantly increased, indicating adrenal stimulation by ACTH (table 1).

TABLE 1 (case 1).—*Results of Studies of Pulmonary Function*

Patient F. F., woman Age, 53 yr. Height, 178 cm.	Weight, 65.2 Kg. Body surface area, 1.82 M.² All respiratory volumes, BTPS *		Diagnosis: Pulmonary fibrosis—cause unknown		
	June 19, 1950	Sept. 26, 1950	Oct. 6, 1950	Oct. 18, 1950	Nov. 3, 1950
Minute volume, L./min	12.5	13.05	12.96	11.13	11.73
Respiratory rate, resp./min	20	24	17	13	17
Tidal volume, L	0.62	0.55	0.76	0.86	0.69
Inspiratory reserve volume, L	0.26	0.36	0.66	0.93	1.03
Expiratory reserve volume, L	0.72	0.76	0.64	0.34	0.34
Vital capacity, L	1.60	1.67	2.06	2.13	2.06
Expected vital capacity, L	2.92	2.92	2.92	....	....
Residual volume, L	1.62	1.14	1.37	1.52	1.18
Residual volume ÷ total volume, %	50.4	40.6	40.0	41.6	36.5
Alveolar ventilation, L./min	3.27	4.74	5.80	7.66	5.12
Respiratory dead space, L	0.306	0.300	0.244	0.292	0.375
Maximum breathing capacity, L./min	88	70	101	115	104
Expected maximum breathing capacity, L./min	83	83	84	84	84
Total capacity, L	3.22	2.81	3.43	3.65	3.24
Alveolar pO_2, mm. Hg	95	101	111	120	117
Arterial pO_2, mm. Hg	47	34	44	50	45
Arterial pCO_2, mm. Hg	45	46	38	32	36
Alveolar-arterial difference, mm. Hg	48	67	67	70	72
Serum CO_2, vol. %	56.27	56.00	55.76	57.81	.....
pH	7.35	7.34	7.42	7.51	7.43
Arterial blood CO_2 content, vol. %	44.56	44.62	42.96	44.31	40.00
Arterial blood O_2 content, vol. %	19.65	16.89	19.48	19.95	19.85
Arterial blood O_2 capacity, vol. %	24.86	24.18	24.39	22.92	24.00
Arterial blood O_2 saturation, %	77	69	79	86	82
Hematocrit, RBC, %	.....	59.5	59.5	55.6	.....

Therapy: ACTH 9/27/50-10/19/50—80 mg./day; cortisone 10/10/50-10/17/50—100 mg./day.
Eosinophil count: 176-11/mm.³
17-Ketosteroids excretion: 9.7-22 mg./24 hr.
* The significance of BTPS is explained in the text under the heading "Methods."

CASE 2 (N. A., P.B.B.H. No. 6B-475).—Fifteen years before admission this 16 year old boy had an eczema which persisted for four years before it subsided, and he began to have bouts of coughing and wheezing associated with insomnia and asthenia. Two months before admission nocturnal orthopnea developed with persistent asthma which failed to respond to 1:100 epinephrine hydrochloride inhalation. Essential physical findings at admission on March 6, 1950 were a respiratory rate of 25 and a barrel-shaped chest with many inspiratory and expiratory wheezes, squeaks and groans. He was moderately dyspneic without cyanosis. Following control observations, a brief course of ACTH therapy was given.

Charts 2 and 3 describe the pulmonary compartments and vital capacity, and show the temporary increase in residual volume, during an asthmatic attack; the effects of epinephrine on the vital capacity and maximum breathing capacity are also demonstrated. The third column of chart 2 shows the improvement due to ACTH, manifested by reduction in the residual volume and increase in the vital capacity. One week after cessation of ACTH therapy the