chitis? Recent papers suggest that high molecular weight components of cigarette smoke may be antigenic.

*Dr. Leitch:* The antigens could be derived from cigarette smoke or bacteria even from our young symptomatic smokers grow bacteria, mainly *H. influenzae* and pneumomocci.

*Dr. Turner-Warwick:* Could we clarify how the step has been made from the identification of mediators in the sputum to a type I response? This seems to me a rather large jump. Could the presence of mediators and IgE in bronchitic sputum merely represent a nonspecific inflammatory response?

*Dr. Leitch:* I don't know if we have a type I reaction. Further studies are planned in this regard.

*Dr. Stechschulte:* Mediators may also be found in the secretions of patients with malignancy. In this situation, we are not implicating an IgE-type reaction. Mast cell degranulation or stimulation may occur by mechanisms other than an IgE-mediated mechanism.

*Dr. Reed:* Dr. Leitch, could these mediators be derived from luminal basophils rather than tissue mast cells?

*Dr. Leitch:* Whatever the release mechanism or source of mediators, we know that they are there and that they are biologically active and may therefore be affecting the course of chronic bronchitis.

**Production of Chemotactic Factor(s) by in vivo Cultured Human Alveolar Macrophages**

*William W. Merrill, M.D.; Gary P. Naegel, B.S.; Richard A. Mathay, M.D., F.C.C.P.; and Herbert Y. Reynolds, M.D., F.C.C.P.*

Pulmonary macrophages (PAMs) are the first line of phagocytic-cell host defense in the lung. Polymorphonuclear granulocytes (PMNs) can readily assist PAMs, but they must be recruited from the intravascular space. We are interested in mechanisms which control the influx of PMNs into lung parenchyma. In bronchoalveolar lavage (BAL) fluid obtained from normal monkeys, we found two factors that produced chemotaxis of PMNs—the C*±* fragment of complement and a small molecular weight (~5,000 daltons) non-complement molecule (*J Clin Invest* 59:273, 1977). The latter factor was produced by PAMs. Recently, a similar chemotactic factor has been isolated from guinea pig PAMs (*Am Rev Respir Dis* 117:15, 1978). Here, we extend these findings to human PAMs.

Respiratory cells were obtained from normal human volunteers, cigarette smokers and nonsmokers, by BAL duringfiberoptic bronchoscopy. These cells (≥93 percent PAMs) were established as *in vitro* cultures by adherence to plastic surfaces in serum-free McCoy's 5A medium, containing antibiotics. PAM cell-layers were given a phagocytic challenge with polystyrene balls (0.8 μm diameter) or left unstimulated; supernatant fluid from cell cultures was sampled at intervals and assayed for chemotactic activity in modified Boyden chambers (5 or 8 μm filters). Indicator PMNs and monocytes were prepared from normal donor blood. Some cultures contained cycloheximide (15 μg/ml) to inhibit protein synthesis. Batches of supernatant were concentrated and gel filtered through calibrated columns of dextran polymer gel (Sephadex G 50) to purify the chemotactic factor for molecular characterization. Our results indicate that stimulated PAMs produce chemotactically active material in culture supernatant which preferentially attract PMNs. Effluent fractions from G 50 gel chromatography of this material give activity in at least two peaks which correspond to molecular weights of 12,500 and ~2,000 d. Production of the chemotactic factor(s) is inhibited by cycloheximide. Thus, PAMs can also synthesize and secrete chemotactic substances which are potent mediators of PMN locomotion.

**DISCUSSION**

*Dr. Gleich:* Could cells other than alveolar macrophages be producing the factors you describe?

*Dr. Merrill:* The subjects for lavage were normal volunteers and lavage fluids contained >95 percent alveolar macrophages. The percentage of lymphocytes and other inflammatory cells was very low.

**A New Method for Studying Tracheal Secretion in vitro: Effect of Adrenergic Agonists in Cats**

*Brian Davis, M.D.; Roger J. Phipps, Ph.D.; and Jay A. Nadel, M.D.*

Present evidence about the effect of specific adrenergic agents on mucin secretion in the airway is controversial. We used the anterior portion of cat trachea mounted in an Ussing-type chamber to study the effects of terbutaline, a beta-adrenergic agonist, and phenylephrine, an alpha-adrenergic agonist, on secretion of sulfated mucins and fluxes of Na*±* and Cl*−* under open-circuit conditions. We added sodium [*35*S] sulfate to the submucosal side of the chamber and monitored sulfated-mucin secretion by measuring the output of mucin-bound [*35*S] sulfate on the luminal side; we also measured fluxes of 22Na*±* and 36Cl*−* in both directions in each tissue. We

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CHEST, 75: 2, FEBRUARY, 1979 SUPPLEMENT