consequent shortening of the kaolin-cephalin clotting time and thrombin time. With such a severe disturbance of the dynamic equilibrium between coagulation and fibrinolysis (Astrup 1956) it is hardly surprising that they suffered extensive thrombotic vascular occlusion. The underlying cause of the imbalance remains undiscovered.

From neighbouring Uganda, however, Bhana and Baddeley (1970) reported on three pregnant women who developed peripheral gangrene after the ingestion of a herbal preparation which is locally supposed to facilitate labour and produce a healthier baby. One of these patients having taken the preparation throughout pregnancy had an arteriographic pattern similar to that produced by ergotism.

In this regard it is of interest that Case 1 presented with a clinical illness compatible with ergotism (Snell and Mukasa, 1948). Furthermore, naturally occurring substances with pronounced antifibrinolytic properties have been known for many years (Tauber *et al.*, 1949). More recently Lipton (1967) described the effect on the uterine and other smooth muscle of laboratory animals of an active glycoside extracted from plants used by East African witch doctors to accelerate labour and procure abortion.

There is clearly a need to search for the possible use of herbal preparations in the pathogenesis of idiopathic gangrene in Africans.

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Bronchorrhoea

ANDREI CALIN

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Bronchorrhoea may be defined as the copious (over 100 ml daily; Keal, 1970) production of non-purulent sputum, the appearance of which suggests diluted uncooked white of egg. Bronchorrhoea replaces the older term "catarrhe-pituiteux" of Laennec. The literature on the subject is confusing and scanty, various terms are used—for example, bronchorrhoea serosa, hydromucous hypersecretion, protein bronchorrhoea, etc.—and only rarely is the phenomenon clearly defined. In the English literature there has been only limited mention of the subject.

Case Report

A 51-year-old man was admitted to hospital in June 1971 complaining of left-sided chest pain. A diagnosis of acute pericarditis was suggested and confirmed by electrocardiogram changes, enzyme studies, and the clinical course. Routine investigations including viral studies failed to define the aetiological factor. He had had no previous illness, apart from an episode of "pneumonia" during the war. Although a heavy smoker (40 cigarettes a day) he denied symptoms of chronic bronchitis and admitted only to early-morning "throat clearing." Four days after admission he developed a cough producing purulent sputum, pyrexia, and both clinical and radiological signs of bronchopneumonia. He responded satisfactorily to ampicillin, becoming afebrile, and all radiological evidence of bronchopneumonia resolved. He continued to expectorate large

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Appendix

Euglobulin lysis times were recorded by the unpublished method of Dr. Christine Hawkey, which is described as follows. To a plain glass tube 12 by 75 mm containing 2 ml 0.02% acetic acid, previously chilled to 4°C, is added 0.1 ml citrated plasma. The contents of the tube are then mixed and centrifuged at 800 g for four min to deposit the euglobulin precipitate. After discarding the supernatant the tube is inverted and drained on filter paper. Thereafter the precipitate is redissolved in 0.3 ml Fearnley's buffer and the solution clotted by the further addition of 0.1 ml thrombin (50 U/ml). The tube is then placed in a 37°C water-bath and observed for lysis.

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amounts of non-purulent sputum, however, which had the appearance of diluted, uncooked white of egg. He was discharged home and remained well apart from two further episodes (in August and September), when the clear sputum became purulent and he developed mild dyspnoea. On each occasion there was clinical improvement after treatment with a broad-spectrum antibiotic given by his general practitioner, and the purulent sputum became clear and mucoid. Four months after the original admission he was reassessed. He was symptom-free apart from the daily production of over half a litre of clear, runny sputum. This was produced throughout the 24-hour period. Neither posture nor activity affected the volume or nature of the sputum.

Physical examination showed no abnormality apart from scattered rales and rhonchi in the chest.

Investigations in October were: E.S.R. 16 mm/hr, W.B.C. 6,500/mm³ (normal differential), eosinophils 2% (absolute count 140/mm³), electrolytes and urea normal, proteins and electrophoresis normal; 24-hour collection of sputum, 600 ml clear fluid becoming thicker on standing, no eosinophils, micro-organisms, or fungi, normal flora, no malignant cells; skin tests for type 1 sensitivity, no immediate reaction to pollens, house-dust mixture, *Dermatophagoides pteronyssinus*, furs, danders, candida, or aspergillus; chest x-ray picture and bronchogram normal. The results of respiratory function tests are given in the Table.

Macroscopically the saliva and sputum were similar. However, bedside examination of the sputum some 30 minutes after expectoration showed a "clot" formation. By contrast, examination of his saliva after the same time interval showed no change. Microscopically the secretions were indistinguishable. Rheological studies

Respiratory Function Tests

	Use of Bronchodilator		Predicted Value
	Before	After	
Forced expiratory volume in 1 sec (l.)	2.4	2.6	3.1
Vital capacity (l.)	3.4	3.5	4.0
Forced expiratory ratio (%)	71	74	455
Peak expiratory flow rate (l./min)	440	485	42-50
Mixed venous PCO ₂ (mm Hg)	41		22-3
Transfer factor (ml/min/mm Hg)	19.3		5.59
Total lung capacity (l.)	5.26		1.87
Residual volume (l.)	2.3

Viscosity patterns (poise) for sputum from patient (1), saliva from patient (2), and sputum from "normal" chronic bronchitic (3), tested from low to high shear rates (S-I).

on the expectorated material confirmed that it had the physical properties expected of sputum. Saliva produced by the patient was shown to have different rheological properties (see Chart).

Comment

It is unusual for patients with bronchitis or asthma to produce more than 25 ml of sputum in 24 hours (Ashcroft, 1965; Miller *et al.*, 1965). In 1948 Rey and Rubinstein described a case of "gelatinous cancer of the lung of bronchorrhoeic form," the dominant symptom being the steady production of a seromucous sputum of 1 litre a day. Two years later Bourgeois *et al.* (1950) described a case of uncontrollable bronchorrhoea, death resulting from "hydromucous inundation of the whole bronchopulmonary system." Rubinstein and Pilheu (1954) reported on three patients who presented with bronchorrhoea; two died within months from "bronchial carcinoma" and the third was still alive 15 years later. Also from Paris, Turiaf *et al.* (1958) thought that bronchorrhoea was a "manifestation of asthma without dyspnoea," bronchial mucosa biopsy findings and associated sputum eosinophilia accounting for this suggestion. Storey *et al.* (1953) reviewed

205 cases of alveolar cell carcinoma. Reference to the sputum was sufficiently precise to permit analysis in 100 patients, 27% of whom raised more than 90 ml of mucoid sputum a day as a late symptom. Indeed, in four cases more than 750 ml was expectorated daily. An association with pulmonary adenomatosis has also been recognized (Marner and Roin, 1966). Kourilsky (1960) claimed that the chief aetiological factors were infection, irritant agents, and allergy.

In investigating bronchorrhoea the aim is to distinguish sputum from saliva. This can be done at the bedside by using the clot test described above, but this should be supplemented by determining the rheological properties of the material. Assay of the neuraminic acid content is also helpful, sputum containing more than saliva (Reid, 1971).

The references cited indicate that bronchorrhoea may be a presenting feature of a pulmonary neoplasm. Apart from this association the major disabilities of the condition are the social difficulties of disposing of large quantities of sputum, increased risk of lower respiratory tract infection due to sputum retention, and the hazard of drowning in one's own bronchial secretion should the cough reflex be depressed. Sulphur crenotherapy had its advocates (Lageze and Passa, 1963) but now corticosteroid therapy is thought to be effective (Israel *et al.*, 1957). A prolonged low dose may be necessary to control the bronchorrhoea. Keal (1971) suggested that the sputum neuraminic acid level may be a guide to treatment, lower levels being associated with a better response. In the case reported here it was felt that steroid therapy was not indicated.

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Cutaneous Lesions in Multiple Myeloma

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Extraskelatal spread from multiple myeloma, particularly with involvement of the spleen, liver, breasts, and kidneys, is relatively common, and has been reported in up to 70% of cases (Hayes *et al.*, 1952). Cutaneous involvement is unusual, and

when present is normally due to extension from an underlying bony lesion. Isolated skin nodules in myeloma are rare, and no examples are reported in the British literature.

Case Report

An 81-year-old woman presented with a two-month history of a tender, 2-in (5-cm) diameter tumour in the right breast, a smaller lump in the left breast, and multiple subcutaneous lumps in both upper arms. Six years previously she had undergone a sigmoid colectomy for carcinoma. Histology showed a tubular columnar cell carcinoma of the colon which had broken through the full thickness of the bowel wall, but sections of mesenteric lymph nodes showed no metastatic involvement. Thereafter she had no intestinal symptoms. The right breast lump was excised and histological examination showed an undifferentiated malignant tumour of fairly uniform spheroidal cells, which were suggestive of a poorly-differentiated myeloma. Serum immunoelectrophoresis

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