and was identified in the MicroScan NegCombo panel Type 12 (Baxter Laboratories, West Sacramento, CA) system, which is incubated without CO₂.

On the basis of the above findings, we are confident that the cause of our patient’s illness was P. maltoca and not Haemophilus aphrophilus. Without further published details it is impossible to state with absolute certainty that all the previously reported cases of pasteurella endocarditis were indeed due to Pasteurella and not Haemophilus species. However, because the growth characteristics of Pasteurella and Haemophilus species on agar are considerably different, we doubt that the majority of the cases cited in our review were indeed falsely identified.

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Cerebrospinal Fluid Rhinorrhea and Group B Streptococcal Meningitis

Sir—We were interested to read the recent review of group B streptococcal (GBS) meningitis in adults by Domingo et al. [1], which highlighted many important features of this rare but important condition. In January 1996 we published a report of a 45-year-old woman who died of GBS meningitis after surviving an episode of bacterial meningitis 9 years previously [2]. Her recurrent CNS infections were related to chronic CSF rhinorrhea caused by a head injury in childhood. Although there have been a small number of reports of GBS meningitis associated with abnormal communication of the subarachnoid space with mucosal surfaces or skin, these cases have been related to malignant disease, recent surgery, or other iatrogenic factors [3–5]. Domingo et al. do not state the cause of the CSF leak in their 25-year-old male patient (case 58).

We would like to draw attention to the importance of chronic CSF leaks (sometimes over many years) in the development of bacterial meningitis. At Royal Hallamshire Hospital (Sheffield, England) 20% (5 of 22) patients admitted with community-acquired bacterial meningitis during an 18-month period were subsequently found to have a chronic CSF leak (authors’ unpublished observation). Remote injury has also been shown to be a significant contributory factor in other reviews of the disease [6], particularly for patients presenting with more than one episode of meningitis. The symptoms of chronic CSF rhinorrhea and otorrhea are frequently misinterpreted by patients and doctors alike (they are frequently diagnosed as sinusitis) and should always be specifically sought in any patient presenting with bacterial meningitis.

For patients who present with meningitis who are known to be at risk of a CSF leak (including those who have undergone previous surgical repair of such a leak), group B streptococcus should be considered a possible pathogen. The most appropriate empirical therapy for meningitis associated with a CSF leak is a third-generation cephalosporin (cefotaxime or ceftriaxone) plus vancomycin in areas where highly penicillin-resistant strains of Streptococcus pneumoniae are prevalent [7], and it is reassuring that Domingo et al. found the former to be effective therapy for GBS meningitis.

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Reply

Sir—CSF leak is the most frequent cause of communication of the subarachnoid space with skin, sinuses, or mucosal surfaces in adult patients with group B streptococcal meningitis (GBSM) [1]. However, CSF leak was documented only four times in our review, and, unlike the patient described by Moss and colleagues, none of our patients with GBSM had had a previous episode of bacterial meningitis [1].

The association between CSF leak and recurrent bacterial meningitis has been known for a long time [2]. Among the etiologic agents of meningitis associated with chronic CSF leak, Streptococcus pneumoniae and Haemophilus influenzae rank first, whereas group B streptococcus has only rarely been reported [3–5]. This may be explained by the rarity of GBSM in adult patients. As we noted in our review, GBSM shares many features with other forms of streptococcal meningitis, including pneumococcal meningitis. Thus, it is not surprising that a chronic CSF leak was found as the main underlying condition in 6.4% of patients with GBSM [1]. This percentage is somewhat lower than that observed for