manual brush cleaning on biomass and community structure of microfouling film formed on aluminum and titanium surfaces exposed to rapidly flowing seawater. *Appl. environ. Microbiol.,* 41(6):1442-1453.

Rate of microfouling (measured by loss of heat transfer efficiency) was accelerated by manual brushing; residual communities secreted twice as much extracellular polymer as did free-fouling communities. Titanium and aluminum differed in rate of fouling (titanium fouled faster), and in structure and diversity of fouling communities. White: Dept. of Biol. Sci., Florida State Univ., Tallahassee, Fla. 32306, USA. (mjj)

E140. Birds

81:6695

Bernstein, N.P. and P.C. Tirrell, 1981. **New southerly record for the macaroni penguin (*Eudyptes chrysolophus*) on the Antarctic Peninsula.** *Auk,* 98(2):398-399. Bell Mus. of Nat. Hist., Univ. of Minn., Minneapolis, Minn. 55455, USA.

81:6696

Birkhead, T.R. and D.N. Nettleship, 1981. **Reproductive biology of thick-billed murres (*Uria lomvia*): an inter-colony comparison.** *Auk,* 98(2): 258-269.

Larger egg volumes, higher chick growth rates, and more and heavier fledged chicks per pair occurred at one of the two Arctic colonies (Coburg and Bylot islands) studied; consistently higher reproductive success at the former was attributed to a 4-day-earlier median laying date, compounded by ice- and rockfalls at the latter. Dept. of Zool., Univ. of Sheffield, Sheffield S10 2TN, UK. (ahm)

81:6697

Duffy, D.C., Natasha Atkins and D.C. Schneider, 1981. **Do shorebirds compete on their wintering grounds?** *Auk,* 98(2):215-229.

Comparison of bird numbers and foraging behavior during the boreal summer and winter at Paracas (Peruvian coast) showed no evidence of 'strong competitive pressures on a tropical wintering ground.' Charles Darwin Station, Isla Santa Cruz, Galapagos Islands, Ecuador. (ahm)

81:6698

Ingólfsson, Agnar, 1976. **The feeding habits of great black-backed gulls, *Larus marinus,* and glaucous gulls, *L. hyperboreus,* in Iceland.** *Acta nat. islandica,* 24:19pp. Inst. of Biol., Univ. of Iceland, Reykjavik, Iceland.

E150. Microbiology (communities, processes: also bacteria, fungi, yeasts, viruses, etc.)

81:6699

Ammerman, J.W. and F. Azam, 1981. **Dissolved cyclic adenosine monophosphate (cAMP) in the sea and uptake of cAMP by marine bacteria.** *Mar. Ecol.-Prog. Ser.,* 5(1):85-89.

Concentrations of cAMP ranged 1-35 $\times$ 10^{12} M, being greatest in nearshore surface samples from early evening through early morning. Dissolved cAMP was rapidly taken up intact by natural populations of marine bacteria, evidently via high affinity transport systems. Much higher concentrations were found in sediments. Presumed sources of dissolved cAMP are planktonic organisms. Scripps Inst. of Oceanog., La Jolla, Calif. 92093, USA.

81:6700

Frankel, R.B., R.P. Blakemore, F.F. Torres de Araujo, D.M.S. Esquivel and J. Danon, 1981. **Magnetotactic bacteria at the geomagnetic equator.** *Science,* 212(4500):1269-1270.

Magnetotactic bacteria contain intracytoplasmic, single-domain, enveloped magnetite particles which cause the cells to orient along geomagnetic field lines. In the Northern Hemisphere, magnetotactic sediment bacteria are nearly all North-seeking (in the Southern Hemisphere, South-seeking) resulting in downward directed motion advantageous for the survival of these microaerophiles. Equal numbers of North- and South-seekers were found near the geomagnetic equator, where magnetic field lines are horizontal, thus supporting the hypothesis of selection for bacterial polarity types by the vertical component of the geomagnetic field. Effects on relative numbers of bacteria of a vanishing vertical magnetic field and of an experimental demagnetizing procedure were reported. Francis Bitter National Magnet Lab., MIT, Cambridge, Mass. 02139, USA. (mjj)

81:6701

Fuhrman, J.A., 1981. **Influence of method on the apparent size distribution of bacterioplankton cells: epifluorescence microscopy compared to scanning electron microscopy.** *Mar. Ecol.-Prog. Ser.,* 5(1):103-106.

For unattached marine bacterioplankton, significant (up to 37%) and variable linear shrinkage occurred