ously, marine incursions moved up major river valleys, across the Alpine fault, and deposited estuarine silts with marine bivalves in the 250-km-long region between Haast and Kaniere (*8*). Former islands and peninsulas northwest of the fault were notched by sea-level highstands; close terrace spacings indicate much slower uplift than for the Southern Alps.

We believe the available data show that the accordant steps are marine terrace time lines that can be used for inferring uplift and erosion rates. Alternative hypotheses for the origin of accordant bedrock benches with rounded quartz pebbles fail simple tests. It is apparent that moas did not violently thrash rocks in the gizzards and later deposit them selectively on flat topographic steps. Neither glaciers nor streams can account for (i) flat shore-parallel benches more than 5 km long or (ii) the presence of rounded quartz pebbles on flat summits along the main divide of the Southern Alps. Gradual spatial changes in lithospheric properties and stress fields are reflected by changes in uplift rates along the Alpine fault. The temporal doubling of inferred uplift rates at about 135×10^3 years ago may be the result of a structural realignment brought about by progressively larger convergence between the Pacific and Australian plates.

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7. Grid reference locations on NZMS 1 S52 topographic quadrangle are 021559 for 830-m marine-terrace remnants 2½ km to the southwest and 091617 for a remnant 6 km to the northeast of the 837-m altitude on Fig. 2, which is at 045574.
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Guanylate Cyclase and the Adrenal Natriuretic Factor Receptor

We read with great interest the paper "Coexistence of guanylate cyclase and atrial natriuretic factor [ANF] receptor in a 180-kD protein" by A. K. Paul *et al.* (*1*). However, several aspects of the data and discussion require comment.

First, the details of the purification were unclear. There is no description of the percent recovery of enzyme and binding activity or of protein. Also, it is unclear whether these preparations represent a single peak fraction off the final chromatographic step or are actually representative of the majority of cyclase and receptor molecules in these cells. It would seem important that, in a report concerned with the purification of an enzyme, these data be included.

In the legend to figure 1, the authors state that 0.12 μg of purified guanylate cyclase was separated by sodium dodecyl sulfate–polyacrylamide gel electrophoresis (SDS-PAGE). However, this amount of protein was well-visualized with Coomassie-blue staining. It is commonly accepted that the lower limit of sensitivity for detection of protein on gels with Coomassie blue with routine use is about 0.5 μg. Paul *et al.* report significantly greater sensitivity in their staining. To detect lower amounts of protein, a sensitive silver stain is required, with sensitivities down to 1 ng of protein (*2*). Thus, Coomassie-blue staining of denaturing gels is not adequate proof of purity of a protein preparation. The authors iodinated their purified guanylate cyclase preparations for isoelectric focusing. It would have been of interest if they had performed SDS-PAGE on these preparations to assess their purity.

In addition, important experiments central to the authors' hypothesis were not mentioned. For example, if the 180-kD protein contains both guanylate cyclase and ANF receptor binding activity, then it should be specifically labeled with ^{125}I-labeled ANF when this peptide is cross-linked to these preparations, as demonstrated in previous studies (*3*). Also, if the cyclase and receptor are the same molecule, then they should coprecipitate, with identical recoveries, when incubated with specific antibody directed at either activity in an immunoprecipitation assay. Paul *et al.* report having used antibodies for Western blot analysis that specifically inhibit particulate guanylate cyclase, yet they do not report the effects of these antibodies on enzyme and receptor binding activities in immunoprecipitation assays. Nor do they indicate how these antibodies were prepared. Are these monoclonal or polyclonal antibodies? What was the source of antigen, and how much antigen was used for immunization? These details would facilitate analysis and interpretation of the data.

Paul *et al.* state, "Only partial purification of any mammalian particulate guanylate cyclase has been achieved to date" and cite an earlier report (*4*). However, the copurification of particulate guanylate cyclase and the ANF receptor to apparent homogeneity from rat lung was published (*3*) 1 year before the appearance of the report of Paul *et al.* The authors do not mention this earlier report in their initial discussion and say in the latter part of their discussion only that these preparations were "highly purified," even though the earlier work provided a rigorous biochemical demonstration of the apparent homogeneity of the protein preparations and the identity of the cyclase-receptor complex (*3*).

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Response: Waldman *et al.* refer to three concerns: (i) lack of detail in the description of the method used to purify the enzyme; (ii) less-than-rigorous documentation of the enzyme's purity; and (iii) lack of acknowledgment of an earlier study in which the authors say they completely purified the enzyme (*1*).

Because of space restrictions, only essential features of the purification of the enzyme were provided in our report. Details that could be excluded without compromising accuracy were deleted. We will be glad to provide these details to any investigator upon request. In the legend to figure 2 of our reference 2, the specific activities of atrial natriuretic factor (ANF) binding and guanylate cyclase at specified purification steps were from single peak-activity fractions.

We did not state that a single protein band, as evidenced by the Coomasie-blue staining of the denatured gel, is absolute