nated as A, B, C and D. When treated with trypsin, four identical functional monovalent fragments are produced. Fragment B (FB) is a small globular protein consisting of three helices which form a regular triangular array. The two antiparallel α helices are formed by residues Gln-128 to Leu-136 and Glu-144 to Asp-155 respectively. The extended N-terminus to Asn-125 is disordered. The two N-terminal helices consist of three turns each, whereas the third (C-terminal) helix is made up of one turn with the rest being stretched out.

Only the N-terminal helices of FB are involved in the contact region of Fc domains. The N-terminus, which extends to Asn-125, is stabilized on binding to the Fc region. Since, in the complex, Fc occupies a diad and the two CH_3 domains retain their lateral symmetry, a conformational change explains the alteration of the CH_2–CH_3 longitudinal associations. FB makes two types of contact with the symmetry-related chains of the Fc fragment in the crystal. The contact 1 is contributed by residues from the CH_2 and CH_3 domains of the Fc fragment and the helical regions of FB. This contact which is physiological covers as much as 1234 Å^2 of the accessible surface area of FB and Fc regions and is stabilized principally by hydrophobic forces. The electron density of CH_2 region disappears indicating that CH_2 domain becomes more disordered in the FB-Fc crystal. Contact 2, a crystal contact, is smaller than Contact 1 and covers only 1012 Å^2 of the accessible surface area. Residues of the second helix and Asp-156 to Gln-159 of FB and only residues of CH_3 domain contribute to this contact. A sulfate ion forms an integral part of Contact 2.

Since the binding of FB does not prevent complement activation[4] and the binding of large $C1_q$ head pieces in between the two CH_2 ears is sterically unfavorable, more mobile regions of CH_2 appear likely to be recognized by $C1_q$ (Refs 1, 2). The inability of human IgG_3 to interact with Protein A has been alluded to the replacement of an amino acid at a strategic position viz. Arg for His-435[5].

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Chilean biochemistry

SIR: Our article concerning biochemistry in Chile[1] elicited a letter to the editor 'on behalf of eight Chilean biomedical scientists working in North American Universities'[2].

The aim of our article was to provide *TIBS* readers with a concise outline of what is being done in Chile in the field of biochemistry. However, the letter criticizes us for not having analyzed the country's political background. We believe that *TIBS* is apolitical and concerned with '*Trends in Biochemical Sciences*' and not with 'Science and Politics anywhere'. Since we are not politicians, we do not intend to discuss the various statements and *non-sequiturs* contained in the letter.

We are accused of being naive or in bad faith, but we are not so naive as to believe in the good faith of those who do not dare to sign their letters. Instead, they prefer to use people who have no personal experience whatever of our scientific reality and working conditions.

The letter contains negative personal innuendos and we regret that these have appeared in *TIBS*, a journal that aims to promote international understanding among biochemists.

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The value of shared authorship

SIR: I should like to respond to some of the views expressed by Gary Conrad in his recent article on authorship and responsibility in scientific publications and manuscript reviews ((*TIBS*, May 1982). I do not believe that shared authorship of original scientific papers between a graduate student and his thesis advisor dilutes the responsibility of that student for the quality and quantity of his output; a student harboring such attitudes has no business embarking upon a career in research. In most instances of which I am aware, the advisor plays the passive albeit vital role of a consultant, honing the student's ability to perceive problems and devise solutions. If anything, joint authorship between student and advisor reinforces their perception of one another as peer and colleague. True, a paper by John Doe and Albert Einstein may come to be referred to informally as 'Einstein's paper' or 'Einstein's theory' although in press it can be expected that Doe will be given equal credit; on the other hand, joint authorship publicly formalizes the association between student and advisor (which may ultimately be helpful to the young scientists during subsequent career development), and can serve to focus special attention on a particular piece of work. From the advisor's point of view, when asked to provide a list of (recent) publications for grant applications, it is authorship that counts as evidence of past achievement and ongoing productivity rather than any acknowledgement at the end of an article.

An item not mentioned by Dr Conrad which I would like to raise and perhaps throw open for discussion is that of *order* of joint authorship. I feel that if the advisor (thesis, or, for that matter, post-doctoral) did not contribute the bulk of 'hands-on' effort in pursuance of a given piece of research, then he should refrain from listing himself as first author, even if he is underwriting the research and publication costs through allocation of grant money. The advisor really has nothing to lose by placing himself second, as tenure committees, journal referees, and grant reviewers are well aware of this practice, and the advisor's authorship still attests to his participation in active research. However, subordination of the graduate student's authorship to that of his advisor may adversely affect the perception of the student's contribution to the work both by himself and by the scientific community at large.

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