

SIR.—Alphabetical ordering of names in multi-author publication results in ambiguity about who did what; non-alphabetical ordering enhances the visibility of the individual by suggesting the order of importance of his contribution. There are no strict rules regarding assignment of publication credit among collaborators; many practices are followed^{1,2}. We show that the policy by which multiple authors of papers published in *The Journal of Physiology* are listed in alphabetical order by surname without indication of the relative contributions of individuals has exerted selective control over publication of research in the journal.

The percentages of papers with different sizes of author-set published in vols 155–175 (1961–1964) of *J. Physiol.* were calculated in cases where the surname of at least one author began with A–E (520 cases) or P–Z (503 cases). Alphabetical value had no significant influence ($\chi^2=0.05$, $P>0.05$) on whether an author published singly or with collaborators, even though in cases of multiple authorship P–Z surnames received first listing in only 7.6 per cent of cases compared with 80 per cent for A–E surnames. The possibility next considered was that P–Z authors published collaboratively in *J. Physiol.* when their authorship position approximated their research contribution but elsewhere when they wished to overcome the ambiguity in assignment of credit imposed by alphabetical ordering. The bibliographies of the 1,023 papers considered above were searched to establish the practice each set of authors had followed when publishing in journals which had no fixed policy on author-sequencing. Alphabetical ordering was maintained at a rate (78 per cent of cases) well above the value (48 per cent) obtained from a count of all references cited in *Annual Review of Physiology*, 26 (1964).

We found, however, that researchers with P–Z surnames avoid publication in *J. Physiol.* relative to those with A–E surnames. Comparison of the relative occurrence of A–E and P–Z surnames as *J. Physiol.* authors and as authors in other journals cited in bibliographies in *J. Physiol.* papers (the first 1,023 cases in vols 155–156) showed that P–Z surnames were significantly under-represented (by 12.1 per cent) as authors of *J. Physiol.* papers ($\chi^2=19.2$, $P<0.001$). Evidence that *J. Physiol.* authors with P–Z surnames maintain alphabetical sequencing in other publications suggests they either are junior collaborators in most research they report or prepared to publish in a manner which at face value renders ambiguous their role relative to co-authors. In latter cases there are probably many factors unconnected with publication of specific research by which this ambiguity is lessened².

Yours faithfully,

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¹ Spiegel, D., and Keith-Spiegel, P., *Amer. Psychol.*, 25, 738 (1970).

² Zuckerman, H. A., *Amer. J. Sociol.*, 74, 276 (1968).

Misconception on MIRVs

SIR.—May I comment on the statement in “Pugwash Worth its Weight in SALT” (*Nature*, 227, 1185; 1970) that: “Although the main strategic implications of MIRVs are as a first strike weapon, they were apparently developed by the United States as a penetration aid against the sophisticated Soviet air defence system which, it is claimed, is capable of being upgraded into an ABM system”. This view, or more simply that the US developed its MIRV as a response to the Soviet ABM, is nearly universally repeated by persons on all sides of the ABM debate, in and out of the US Senate. It appears to be

wrong. This is documented by two pieces of Congressional testimony.

Dr John Foster, Director, Defense Research and Engineering of the US Department of Defense, gave this evidence in 1968:

“Senator Mansfield: Is it not true that the US response to the discovery that the Soviets had made an initial deployment of an ABM system around Moscow and possibly elsewhere was to develop the MIRV system for Minuteman and Polaris?”

“Dr Foster: Not entirely. The MIRV concept was originally generated to increase our targeting capability rather than to penetrate ABM defenses. In 1961–62 planning for targeting the Minuteman force it was found that the total number of aim points exceeded the number of Minuteman missiles. By splitting up the payload of a single missile (deleted) each (deleted) could be programmed (deleted) allowing us to cover these targets with (deleted) fewer missiles. (Deleted.) MIRV was originally born to implement the payload split-up (deleted). It was found that the previously generated MIRV concept could equally well be used against ABM (deleted).”

Mr Laird, the Secretary of Defense, gave this evidence in 1969:

Reason for US MIRV development

“Senator Pell . . .

“Now, in connexion with the system around Moscow, the so-called Galosh, the existence of which we discovered, I think, in the early 1960s, haven’t we responded to that with our MIRV program? Wasn’t it the Titan MIRV at that time?”

“Secretary Laird: Well, I don’t believe that necessarily is the case, Senator Pell. I would like to agree with you but having worked on these programs through the years—

“Senator Pell: Much more closely than I have because you were on the Armed Services Committee.

“Secretary Laird: As much as I would like to agree with you, I can’t.

“Senator Pell: You feel it is a separate response, a normal outgrowth of regular research and development.

“Secretary Laird: Yes; it was a separate response and it was something we had under development and under consideration for several years even prior to the time that we knew of the deployment of the Galosh. I would not want to mislead anyone, as much as I would like to agree with you.

“Senator Pell: But our basic reason for developing MIRV was to increase our own deterrent power, not related, in your view, then to Galosh?”

“Secretary Laird: It was not related to Galosh because we started appropriating funds for the development of this program prior to the time we knew Galosh was in being. That is why I cannot respond that way to that question.

“I happen to have been involved in the appropriation process, and we were funding the research and development on the MIRV, and we knew about these possibilities and had funded work on it prior to the time that the Soviet deployment of Galosh around Moscow was discovered.”

The development of MIRVs is a most important point to get straight. MIRV represents a quantum, and a critical, jump in strategic weaponry. Various US administration spokesmen, past and present, have been guilty of repeating on public occasions the common misconception as to its origin, despite the above evidence to the contrary. The wrong view has no doubt been perpetuated because it presents the development (and the deployment) of MIRV as a response to Soviet action. Post ABM, ergo proctor ABM?

It may serve a useful purpose for US administrations, both the previous Democratic and the present Republican one, to maintain this error in misunderstanding, but that is no excuse for the rest of us to follow suit.

Yours faithfully,

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