within itself the seeds of its own destruction. Brightman therefore urged that any planning scheme must be seriously limited by knowledge "of man's spiritual needs, some regard to moral values and be based on cooperation and legislation rather than command"[74]. It is not without significance that in the year between the Munich agreement and the invasion of Poland *Nature* gave its support to the Moral Rearmament movement[75,76].

Finally, a survey of *Nature*'s politics would be incomplete without some reference to its campaign to stimulate the social consciousness of natural scientists. Gregory and Brightman recognized that "the indifference of politics to facts and its dependence on narrow prejudices are paralleled by the apathy of scientific workers themselves towards public affairs"[77]. In an attempt to shake such narrow professionalism *Nature* published six times as many leaders on the theme of social responsibility in the thirties as it did in the previous decade. Brightman[78] wrote in 1935

> . . . science on the scale it is pursued today is an integral part of the social organization of the State. Wherever he works, the man of science is a part of the machinery of State, and there is no real immunity of science from its political environment. . . .

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WE WUZ ROBBED

THE World Cup which has recently been enacted in Britain may have been fun to watch, but there is no question that it was a thoroughly badly designed experiment. If the intention was to find out which football team is the best in the world, the organizers would have gone about their task quite differently.

Just as the frequency of deaths from kicks by horses in those far-off but now classical stables of the Prussian Army are described by a Poisson distribution, so are the numbers of goals scored by the competing teams in the recent series of World Cup matches. Table 1 shows the numbers of occasions during the series of thirty-two games (each involving two teams) on which specified numbers of goals were scored, together with the frequencies described by a Poisson distribution of the form $P(n) = e^{-q}q^n/n!$ with $q = 1{\cdot}234$, or the mean of the observed scores.

Table 1

Numbers of goals	Observed	Calculated $65.P(n)$
0	18	18·4
1	20	22·8
2	15	14·0
3	7	6·0
4	2	1·8
5	2	0·5
More than 5	0	0·7

In reality an even better agreement between fact and prediction can be obtained by taking $q = 1{\cdot}27$, a value which lies well within the standard deviation of the mean.

The mere fact that a Poisson distribution can describe so well the distribution of scores by individual teams goes a long way to suggest that the teams were much of a muchness in talent and their scores were independent of each other. From this point of view, the decision that the outcome of the whole competition should depend on the outcome of a single game between the two so-called finalists was as much of a farce as a great many West German supporters already know it to have been. If it is assumed that the goal scoring potentiality of the two teams is equally well described by the Poisson distribution already specified, the chance that the result will be a draw is a mere 0·27. In other words, if two teams are equally matched, the chance that the result will be an active injustice to one of them will be 0·73. By the same token, a team which is slightly less skilled than its opponent can nevertheless expect a one in three chance of winning the deciding match.

Chancy outcomes of individual games are given extraordinary importance by the overall design of the World Cup competition, in which small groups of teams play an incestuous competition on their own before one team is sent on to another stage in the competition. Obviously a properly randomized block design would be an improvement. But even within the framework of the existing competition, much could be done to reduce the gross sampling error under the present arrangements. Replication of the crucial games by a series of identical trials is one obvious remedy, and the organizers of the World Series of baseball games in the United States have in this spirit arranged that the winner should be the one who wins the most of seven games. The ideal is that in future World Cup competitions, the organizers should fix a certain limit of confidence (say, $P < 0{\cdot}01$) and then that they should require that the finalists go on playing against each other either until the superiority of one or the other of them is properly established, or until both parties agree to negotiate a draw.

A more practicable alternative might be to redesign the parameters of the game of football in such a way that a respectable degree of confidence in the outcome of the competition can be acquired in a reasonable interval of time. If, for example, it were agreed that single cup finals should remain, but that no team should be declared the winner until its score exceeds that of its opponent by three standard deviations of Poisson distribution, it might be necessary to design the game of football so that it would be practicable for one side to score 100 goals or so within the limits of endurance of the spectators. This implies that the parameter q would have to be much greater than under the present rules. Such a change could easily be brought about, possibly by widening the goalposts or by abolishing goalkeepers. The precise method by which these matters are attended to is, of course, much less important than that they should be dealt with quickly. The whole of South America knows that.