THE JOURNAL OF PHILOSOPHY

VOLUME LXXIX, NO. 5, MAY 1982

CONFLICT AND SOCIAL AGENCY*

FORMAL analogies between criteria for rational individual decision making and group or social decision making have been evident to many authors ever since Plato exploited analogies between the organization of the soul and the state in the *Republic* in expounding his conception of Justice. Nonetheless, there is a widespread reluctance to acknowledge the existence of groups and institutions as agents. This leads to some bizarre juxtapositions.

Thus, neoclassical economists are not noted for their sympathy with notions of group mind. Yet, in expounding the theory of consumer demand, families are often allowed to qualify as consumers. Such consumers are taken, ideally at least, to be maximizers of their preferences or valuations, subject to budgetary constraints. Given the indifference maps representing the consumer's preferences and the budgetary constraints, demand curves are derived. Such analysis is not restricted to persons, but is intended to apply to any consumer, including a family. Families make choices from accessible commodity bundles, given budgetary constraints. They are taken to be rational preference maximizers like individual consumers and to have preferences representable by indifference maps. In this context, no distinction between individual and social decision making is drawn.

Not only are corporations often qualified legally to be persons; but corporations and other business firms are taken in both posi-

* Work related to this essay began while I was a fellow of the National Endowment of the Humanities and associate fellow of Darwin College, Cambridge University. This work has received subsequent partial support from the National Science Foundation. I have benefited from written comments by Amartya Sen and extended discussions with Paul Lyon. John Watkins and Ned McLennan have repeatedly reminded me of the importance of phenomena like that exhibited in the Allais paradox. They were right.

0022-362X/82/7905/0231$01.60

tive and normative theory to make decisions relative to information available to them and to be subject to criticism depending on whether the decisions are intelligent given their aims.

It is well known that the high priest of Hacking's "heyday of ideas," Thomas Hobbes, spoke of the endowments and actions of the "sovereign" in a manner neutral with respect to whether the sovereign was a person, parliament, or citizenry. His individualism did not prevent him from discussing group agency.

The best known effort in recent years to apply canons of rational choice to social entities is that of Kenneth Arrow. According to Arrow, appropriate social groups are to be represented as seeking to maximize the welfares of their citizens or, more accurately, to maximize some increasing function of the welfares of their citizens. Arrow's concern and the concern of the participants in the debate that followed his justly celebrated *Social Choice and Individual Values* focused chiefly on the relations that do or should obtain between the valuations made by the individual citizens, whose interests are to be promoted by society as represented by rankings of the "social states" or options some subset of which are feasible for society, and the social evaluation or preference ranking as represented by another weak ordering of the same social states.

Among the social institutions to which Arrow thought his approach might apply are included markets in which producers and consumers exchange goods leading to social states in which goods are allocated to individuals in certain ways and committees where decisions are taken according to some voting mechanism.

J. M. Buchanan has complained against Arrow that "Voting and the market, as decision making mechanisms, have evolved from, and are based upon an acceptance of, the philosophy of individualism which presumes no social entity."[1] He complains because he thinks that Arrow is committed to the existence of such social entities when Arrow assumes that the rationality of decision-making mechanisms such as voting or the market should be assessed in terms of whether social preference is maximized where social preference induces a weak ordering over the feasible social states. Because Arrow flouts individualism in this manner, his approach is deeply flawed at the very outset.

One response to Buchanan's objection is to reject individualism. That is to say, one might concede that social groups are sometimes agents in the sense that they make choices to promote given ends

[1] "Social Choice, Democracy and Free Markets," *Journal of Political Economy*, LXII (1964): 117.

and that their evaluations of options and the choices they make may be assessed for rationality.

Buchanan, however, thinks that Arrow cannot, given his other commitments, do so consistently, as the following passage reveals:

> Rationality or irrationality as an attribute of the social group implies the imputation to that group of an organic existence apart from that of its individual components. If the social group is so considered, questions may be raised relative to the wisdom or unwisdom of this organic being. But does not the very attempt to examine such rationality in terms of individual values introduce logical inconsistency at the outset? Can the rationality of the social organism be evaluated in accordance with any value ordering other than its own?
>
> The whole problem seems best considered as one of the "either-or" variety. We may adopt the philosophical bases of individualism in which the individual is the only entity possessing ends or values. In this case no question of social or collective rationality may be raised. A social value scale as such simply does not exist. Alternatively, we may adopt some variant of the organic philosophical assumptions in which the collectivity is an independent entity possessing its own value ordering. It is legitimate to test the rationality or irrationality of this entity only against this value ordering (116).

Thus, according to Buchanan, there is nothing inconsistent or incoherent in attributing "organic existence" or agency to a social group such as a corporation. Such an agent may be understood to be making decisions in a manner that seeks to promote its values. Buchanan's own metaphysical predilections are in favor of individualism. He does not acknowledge institutional agents—especially in the case of groups participating in market exchange or committee voting. But his criticism of Arrow is not directed primarily to the issue of the "organic existence" of social groups.

His charge is that Arrow's project suffers from incoherence. He claims that the "very attempt" to examine the rationality of group decision making "in terms of individual values" introduces "logical inconsistency" at the very start.

According to Buchanan, Arrow is not incoherent in attributing social preference rankings of social states to social groups. That is in keeping with the view of social groups as having "organic existence" apart from that of their members. The "logical inconsistency" emerges when Arrow seeks to represent social preference as a function of the preferences of citizens for the same social states. Since Arrow must do this if he is to relate his analysis to markets or committees who take decisions by voting, Arrow can apply his theory to these cases only at the cost of "logical inconsistency."

Buchanan's critique of Arrow raises two distinct issues:

(1) Should we attribute rationality to social groups?

(2) When we do attribute rationality to social groups, may we consistently allow social preference to be a function of individual preference?

We have already observed that even students of market economies attribute beliefs, desires, goals, values, and choices to families and to firms and, of course, government agents (which may be bureaus rather than bureaucrats) as well as to persons. No doubt the mechanisms whereby the decisions taken by such social agents are to be explained typically involve reference to the behaviors of and, indeed, sometimes the decisions taken by individual agents (and by other social agents). Perhaps group choices are redescribable as complex processes involving no other choices than those of persons. But this need not detract from the reality of such group choices any more than the redescribability of individual choices as complex neurophysiological processes detracts from the reality of individual choices. Nor should redescribability in itself preclude the propriety of subjecting social choice to canons of rationality any more than it should preclude the propriety of subjecting individual choice to the very same canons.

When we focus on characterizations of social groups in terms of their beliefs, goals, choices, and other such propositional attitudes, we are no more concerned with the underlying mechanisms than we are when we use such characterizations of human agents or, for that matter, of automata. Perhaps differences in the "hardware" should make a difference in the view we take of the principles of rational preference, belief, valuation, and choice; but, unless a decisive case is advanced that this should be so, it seems sensible to seek an account of rational choice, belief, preference, and valuation which is indifferent to whether the agent is human or not and, if not, whether it is automaton, animal, angelic, or social.

The ontological sensibilities of some may be offended by speaking of groups as agents. But if they are prepared to attribute beliefs, values, and choices to groups as well as to individual humans and to think that such values, beliefs, and choices ought to be judged by the same principles of rationality as are applied to human agents, they are recognizing such social entities as agents in the only sense that matters here.

Arrow's own response to the critiques of Buchanan and of I. M. D. Little is curious in this respect. He contends that he was concerned

with rules for arriving at social decisions which "may be agreed upon for reasons of convenience and necessity without its outcomes being treated as evaluations by anyone in particular."[2]

Arrow appears quite anxious to disavow commitment to group minds or social groups as organic beings. Yet, according to his account of social choice, groups do choose one from among a set of feasible social states in an environment and, if rational, do so in a manner that is optimal relative to a social preference which weakly orders the social states. In this connection, he cites with approval a comment by Karl Popper: "Not a few doctrines which are metaphysical, and thus certainly philosophical, can be interpreted as hypostatizations of methodological rules."[3] Thus, for Arrow, in social choice we have choice without a choosing subject and preference without a preferring subject, just as, for Popper, in science we have knowledge without a knowing subject.

I sympathize with the response of C. R. Plott to Arrow's maneuver when he declares that it is "operationally" difficult to distinguish efforts motivated from Arrow's point of view from efforts motivated from points of view that treat society as an organic entity.[4] Plott's operationalist rhetoric is questionable; but it is irrelevant to the core of his observation. Any system, whether it is animal, vegetable, or mineral, whether it is an automaton, a human, or a group of automata or humans, can qualify as an agent for the purpose of discussing rational choice (which is the context in which Plott discusses Arrow's views) provided that choices, beliefs, preferences, values, and goals are ascribable to the system and provided that it is appropriate to urge conformity to norms of rational preference, belief, and choice.

To say this does not imply that all social groups act as agents or that those which do do so all the time. However, we cannot claim more for animals, automata, or even human beings. I have characterized agenthood in terms of the propriety of criticism from the vantage point of norms of rational choice. I do not have any independently specifiable criteria for determining such propriety; but we do not need any to appreciate the hard core of Plott's insight, which is that when qualms about group minds are construed as an objection to attributing agency to social groups, then talk about social preference and social choice should be avoided—at least in

[2] *Social Choice and Individual Values* (New York: Wiley, 2nd ed., 1963), p. 106.
[3] *The Logic of Scientific Discovery* (New York: Basic Books, 1959), p. 55.
[4] "Path Independence, Rationality and Social Choice," *Economica,* XLI (1973): 1078.

any sense in which such preference and choice is subject to critical scrutiny by norms of rationality. Arrow and those who follow him cannot have their cake and eat it. Retreating to the third world is no more acceptable in discussions of social choice than it is in discussions of the growth of knowledge.[5]

To this extent, Plott's view coincides with Buchanan's—and quite rightly so. But Arrow need not have denied agency to social groups. Indeed, given his position, he should have done precisely the opposite. Moreover, in doing so, he could still have defended himself against the main thrust of Buchanan's criticism, to which we now turn.

Recall that the second and critical step in Buchanan's critique of Arrow is his denial that social preferences (if there are social organisms having them) can coherently be made to depend on individual values. Buchanan thinks it a "logical inconsistency" to "attempt to examine such [social] rationality in terms of individual values" (116). Clearly he is thinking of social agents who maximize values in a manner independent of the interests of the citizens or subjects. Social agents are to be thought of as promoting their own interests just as individuals are to be thought of as promoting their own personal concerns.

Some social institutions undoubtedly seek to promote their own selfish interests just as individuals do. Social agents, like human agents, can be selfish or, if other-directed, can be directed toward other social agents. But just as, at least on some occasions, human agents can seek to promote the interests and welfare of other human agents, so too, social institutions can seek to promote the interests of human agents who are somehow related to the social agents in question as citizens are. If there is no logical inconsistency in the one case, there should be none in the other.

Thus, it is not incoherent to regard a society that allocates commodity bundles through a market mechanism as an agent. The market mechanism in operation provides a procedure whereby the society makes certain kinds of social choices. We may ask two questions about the way such choices are made: (a) Are the choices made in a manner maximizing some social preference? (b) If the answer is affirmative, are the social preferences dependent on the interests of the participants in the market?

[5] I have advocated thinking of knowing subjects as comprising institutions such as scientific communities as well as persons for some time, but most recently and explicitly in *The Enterprise of Knowledge* (Cambridge, Mass.: MIT Press, 1980), 1.1-1.5.

Arrow's impossibility theorem presupposes that affirmative answers may be given to both questions but then goes on to assert that the dependency of social preference on the preferences of citizens cannot jointly satisfy several important conditions.

Perhaps, as Buchanan suggests, there is nothing disturbing about this result as it applies to the use by society of markets as choice mechanisms for the distribution of commodities to consumers. In any case, whether there is or is not something troublesome about Arrow's result, the trouble arises (if it does) for any social agency seeking to maximize social preferences aimed at promoting individual welfares and not just for such agencies that seek such ends through the use of market mechanisms.

Moreover, to declare that Arrow's result misses the mark because social groups cannot be taken coherently to be maximizers of social preferences depending on individual values is no way to neutralize the impact of Arrow's theorem. Buchanan to the contrary notwithstanding, nothing in logic prevents our taking social groups to be agents of the sort that seek to maximize just such preferences. Blanket refusal to attribute agency of this kind to social groups as practiced by Buchanan is conceptual stonewalling which places roadblocks in the path of inquiry.[6]

Insisting that social institutions should sometimes be recognized to be agents does not entail insensitivity to the differences between persons and social institutions—especially the morally relevant differences. Neither an unborn human fetus nor someone in coma is an agent subject to critical control according to canons of rational choice. Yet, they are clearly objects of moral concern; and some apparently are prepared to insist that they be treated with the same moral respect as is to be accorded other human beings. Conversely, attributing agency to animals, automata, or social institutions does not entail granting such agents the same moral concern and respect we accord human agents.

Agency is undoubtedly a morally relevant trait; but it is one among many. We should not be deterred from scrutinizing the decisions and aims of institutions with the aid of canons of rational-

[6] It should be noted in passing that Arrow's formalism for social choice can be applied to the evaluations of the options of a person seeking (perhaps because of moral conviction) to promote the welfares of others. Hence, even if Buchanan had (counter, in my view, to fact) been right about social agency, Arrow's analysis would still retain important applicability. I do not seek, however, to defend the applicability of Arrow's analysis in general. My concern has been with those contexts where governmental, corporate, or other institutional policies are considered.

ity because of moral scruples any more than we should be prevented from doing so by metaphysical dogma.

Nonetheless, some justifiable skepticism remains concerning Arrow's assumption that social groups are representable, at least on some occasions, as maximizers of social preferences. Society is presented with a choice between social states belonging to some subset S of a domain U of entertainable social states. According to Arrow, society has a system of preferences which induces a weak ordering of the elements of U. Society's evaluation of the elements of S is the restriction of that weak ordering over U to the elements of S.

Society is taken to have as its goal the objective of promoting the values or welfares of its "citizens," where the "welfares" of the citizens are representable by weak orderings of the elements of U (and, hence, of S)—each citizen being assigned an ordering.

The individual valuations are usually different rankings over the same social states. Hence, to maximize according to one of these rankings is incompatible with maximizing according to another. In this way, social agents, like personal agents, often face decision problems where the agent is committed to promoting different values which conflict in the way they rank the feasible options.

Both in the first edition and even more so in the second edition of *Social Choice and Individual Values,* Arrow insists that the evaluation of social states or options society ought to use in determining which options are admissible should be a weak ordering of the options or social states and that the admissible set should be restricted to those which are optimal relative to that weak ordering.

Thus, Arrow presupposes as a condition of rational choice that conflicts of value be resolved prior to choice. Hence, he sees the problem presented to him as focused on resolving the conflict between the evaluations for the several citizens according to some rule which determines, for each "profile" of individual values, a social preference ranking that weakly orders the domain U.

It is well known, of course, how widespread the view is that rational individual decision making ought to maximize preferences. By 'preference' here, I do not necessarily mean a ranking of alternatives with respect to anticipated satisfactions. The individual may have taken into account moral, political, economic, cognitive, and aesthetic values in making a ranking. But precisely because he may do so and because these diverse desiderata can lead to conflicting rankings of the same alternatives when employed in isolation from one another, the requirement that preferences be maximized relative to a single ranking presupposes that such conflicts be resolved prior to choice.

Even moral theorists, who feign to dispense with the notion that rational agents should maximize preferences in the generous sense just indicated in favor of approaches grounded on principles of obligation and permission, share the same outlook. In the first place, if, in a given context of choice, a particular option is held to be obligatory, it is presumably ranked over the other alternatives and in this sense preferred over them. Second, if moral principles conflict, appeal is typically made to second-order principles that arbitrate and prescribe which options among those feasible are morally (or legally) admissible. For the most part, so I suggest, decision theorists and moralists agree that, to be rational or coherent at the moment of choice, an individual agent should have ironed out all conflicts at the moment of choice, or, if not, we should regard his choice as itself constituting an expression of his resolution of the conflict.

Arrow's view of rational social choice is no different, in this respect, from received notions of rational individual decision making.

On the other hand, insofar as there is some reason for skepticism concerning the propriety of mandating that conflicts be resolved prior to choice in the context of individual decision making, it becomes at least entertainable that such skepticism should be endorsed in connection with social decision making as well.[7] Objection to the requirement that society maximize preferences represented by a weak ordering of social options along these lines should not be confused with objections, like Buchanan's, which are grounded on preconceptions concerning when one can and when one cannot attribute agency to social institutions. This skepticism derives from doubt concerning the conditions on rational choice, whether the agent is individual or social.

The issue is not whether preferences, values, and goals do or do not come into conflict. Nor is it whether it is rational for an agent to suffer from conflict in his values. That value conflict occurs and confronts even rational agents is widely acknowledged. What is questionable is whether rational agents should have resolved all conflicts when fixing on a decision, so that they can claim that the option chosen is for the best, all things considered. The dominant view is that rationality prohibits decision making under unresolved conflict. I mean to reject this view.

According to strict Bayesians, ideally rational agents maximize expected utility. To determine expected utilities for feasible options, however, the agent must be in a position to make judgments

[7] K. O. May argued essentially along these lines in "Intransitivity, Utility, and the Aggregation of Preference Patterns," *Econometrica,* XXII (1954): 1-13.

of probability enabling him to assign probability numbers to hypotheses concerning "consequences" of his options conditional on his implementing them and utility numbers (unique up to positive affine transformation) to these hypotheses. In this way, the agent's evaluation of his feasible options in terms of expected utility would be free of any conflict.

A common source of skepticism about strict Bayesian doctrine concerns the grounds on which probability numbers are to be assigned. Often it seems that, given the available evidence and background knowledge, there is no warrant for favoring one system of probability judgments over another. Personalist Bayesians advocate picking a system of judgments out of one's hat, often covering up the arbitrariness of the procedure with a display of rhetoric and a reminder that one's judgments must at least be coherent. Others follow in the footsteps of Harold Jeffreys and Rudolf Carnap by seeking objective criteria for constraining probability judgment. Typically they stumble into inconsistency or obscurantism.[8]

The great statisticians, R. A. Fisher, Jerzy Neyman, and Abraham Wald, who pioneered in the 1920s, 30s, and 40s what were to become the dominant approaches to statistical theory in the postwar period, sought to avoid both paths. They thought that, when there was no warrant for making definite probability judgments, one should avoid making them—counter to the advice of personalist Bayesians. And they denied that one could devise an inductive logic so strong as to justify numerically definite probability judgments in every situation. They sought methods that either bypassed the need to use Bayes' theorem or displaced it. And Neyman and Wald, both of whom thought that statistical theory ought to be viewed as a branch of a theory of decision making, sought ways and means of making decisions under conditions where the injunction to maximize expected utility cannot be obeyed because probability information is lacking.

These authors insisted that it is better to remain in a state of unresolved conflict—i.e., in suspense—concerning how to make probability judgments than to resolve such conflict arbitrarily or to introduce principles of inductive logic of questionable merit. But when probability judgment is indeterminate in this manner, calculations of expected utility must also be indeterminate even if the utility information available is precise. Thus, one option might rank over another according to one probability distribution, and the ranking might go the other way according to another. If there

[8] For a beautifully clear exposition of the troubles with objective Bayesianism, see T. Seidenfeld, "Why I Am Not an Objective Bayesian," *Theory and Decision*, XI (1979): 413-440.

is no warrant for favoring one distribution rather than the other, the agent should be in suspense not only as to the merits of the two distributions but also as to the merits of the rival ways of evaluating his feasible options with respect to expected utility. That is to say, he should remain in a state of unresolved conflict even when facing a decision. Neyman and Wald, among others, suggested criteria for evaluating feasible options to be used when consideration of expected utility fails to render a verdict—such as looking at security levels. I have sought to elaborate such an outlook myself elsewhere.[9]

Conflict in how an agent evaluates his options with respect to expected utility need not be engendered by indeterminacy in probability judgment. Conflict in how the agent evaluates the "possible consequences" of his options (how he evaluates his "utilities") can also generate conflict in the appraisal of options with respect to expected utility.

An interesting illustration of this is furnished by an example introduced into general discussion by Maurice Allais.[10] Mr. Unsurething is presented with two different situations where he must choose between two options. In both situations a ball is to be selected from an urn containing 100 balls of which one is red, 89 white, and 10 are blue. In situation I, option *A* guarantees $1,000,000 regardless of the outcome of the draw. Choosing option *B* yields nothing if a red is drawn, $1,000,000 if a white is drawn, and $5,000,000 if a blue is drawn. In situation II, option *C* pays $1,000,000 if a red or blue is drawn and nothing otherwise, whereas option *D* pays nothing if a red or white is drawn and $5,000,000 if a blue is drawn.

In both situations I and II, the probabilities of possible outcomes are quite determinate. And so are the monetary payoffs. The following table sums up the pertinent information:

	1 Red	89 White	10 Blue
I			
A	$1,000,000	$1,000,000	$1,000,000
B	$0	$1,000,000	$5,000,000
II			
C	$1,000,000	$0	$1,000,000
D	$0	$0	$5,000,000

[9] In greatest detail in *The Enterprise of Knowledge* (Cambridge, Mass.: MIT Press, 1980) and previously in "On Indeterminate Probabilities," this JOURNAL, LXXI, 13 (July 18, 1974): 391-418.

[10] "Le Comportement de l'homme rationnel devant le risque: Critique des postulats et axiomes de l'école américaine," *Econometrica,* XXI (1953): 503-546.

Notice that the only difference between the payoff matrices for situations I and II concerns the case where a white ball is drawn. In situation I, Unsurething receives a million whatever he does, and in situation II he receives nothing. According to the so-called "sure thing principle" enunciated by L. J. Savage[11] and implied by strict Bayesian doctrine, Unsurething should weakly prefer option *A* to option *B* in situation I if and only if he weakly prefers *C* to *D* in situation II.

Allais reports that the most frequent response concerning what Unsurething should do in the two situations among those who are prudent and are so regarded by others is that *A* be chosen in situation I and *D* in situation II (527).

The attractiveness of this verdict is widely acknowledged, and even Savage conceded its pull (103).

Although Allais's paper appeared before Savage's book, Allais does refer to another presentation of Savage's axioms and is quite clear that he thinks that the predominant response to the two predicaments just described is in violation of what was subsequently called the "sure thing principle."[12]

The predominant response would, indeed, exhibit violation of the sure-thing principle were it the case that Unsurething's choice of *A* in situation I revealed his strict preference for *A* over *B* and his choice of *D* over *C* in situation II revealed his strict preference for *D* over *C*.

Allais himself declares that his own abstract definition of rationality entails that the set of feasible options should be weakly ordered, apparently so that the option chosen may be identified as optimal (518 and 522). That is to say, Allais insists that to be rational an agent should be free of conflict as to how his options are to be ranked. And this assumption implies that the predominant response is in violation of the sure-thing principle.

Observe, however, that, if we reject Allais's assumption that rational agents resolve conflict in their choice, the predominant response no longer manifests violation of the sure-thing principle; for it is at least entertainable that Unsurething is in conflict as to

---

The proposed analysis of Allais's problem should be compared with the different approaches developed by D. Kahneman and A. Tversky, "Prospect Theory," *Econometrica*, XLVII (1979): 263-292, and by P. Gärdenfors and N.-E. Sahlin, "Decision Making with Unreliable Probabilities," unpublished manuscript.

[11] *The Foundations of Statistics* (New York: Wiley, 1954): pp. 20-22.

[12] Allais, *op. cit.* contains a characterization of Savage's "axiom of independence" and on pp. 527/8 explicitly states that the example under consideration shows the "pseudo-evident" character of Savage's axiom.

how to rank *A* and *B* with respect to expected utility and likewise with respect to *C* and *D*. Such conflict cannot arise as a result of indeterminacy in probability judgment. The probabilities are numerically definite. But even if Unsurething prefers \$5,000,000 to \$1,000,000 to \$0 and even if the marginal utility of money decreases at rates sufficient to guarantee that the difference in value between \$0 and \$1,000,000 is greater than the difference between \$1,000,000 and \$5,000,000, Unsurething might be in conflict as to whether the ratio of the two differences is greater or less than 10/1. And if he were in such conflict, then Unsurething would be in conflict also as to whether to rank *A* over *B* or *B* over *A* with respect to expected utility and would be in a similar conflict with regard to *C* and *D*.

Under these circumstances, Unsurething might choose *A* over *B* because the "security level" or "worst possible case" is better for *A* than for *B*. And he might choose *D* over *C* even though the security levels are the same because the second worst possible case is better for *D* than for *C*. In that event, Unsurething has chosen *A* over *B* without preferring *A* to *B* and has chosen *D* over *C* without preferring *D* to *C*. Of course, *A* beats *B* when considerations of security are taken into account, and *D* beats *C* according to the same factors. But Unsurething has invoked these criteria only because the conflict in his utilities prevents him from rendering a verdict concerning his options taking consideration of expected utility alone into account. Thus, he does not prefer *A* to *B* and *D* to *C* "all things considered"—at least not in a sense that yields a violation of the sure-thing principle.

In my opinion, the tradeoff between giving up the sure-thing principle and the requirement that rational choice be under unresolved conflict favors giving up the latter—counter to Allais's own conclusion.[13] Of course, strict Bayesians will refuse to abandon either condition, insisting that the predominant response to the Allais phenomenon illustrates how vulnerable to fallacy even the sanest of us are and how important it is for all of us to receive good training in Bayesian rationality.

The approach advocated here suggests that instruction in the Bayesian catechism is less than urgent and even, for some purposes,

[13] In *Decision Analysis* (Reading, Mass.: Addison-Wesley, 1968), pp. 82-85, H. Raiffa offers an interesting critique of Allais's example. He gives some striking arguments implying the untenability of the predominant response. These arguments presuppose that rational agents choose an option they most prefer according to a weak ordering representing their conflict-free valuation of the feasible options. Raiffa's arguments appear to me to be telling against someone like Allais who shares his assumption that rational choice ought to be free of unresolved conflict. Space does not permit detailed discussion of Raiffa's arguments here.

harmful. In particular, the predominant response to the Allais problem may prove to be the sensible response after all.

Given that Unsurething prefers more money to less and given that his utility function for money exhibits diminishing marginal utility of money, should he be required to decide whether the ratio of the differences in utility between receiving a million and receiving nothing and between receiving five million and receiving one million is greater than, equal to, or less than 10/1? Perhaps there are occasions where he may have other value commitments which can be invoked to justify some judgment on this matter. But it seems absurd to suppose that, to be rational, Unsurething must have sufficient other commitments which, together with analogues of principles of inductive logic for utility judgment, suffice to render a verdict. And it seems equally absurd to insist that, in the absence of such commitments, Unsurething should decide without justification in order to save his reason. He should be allowed to suspend judgment.

The conflict in value considered here concerns the rate at which the value of money increases with an increase in monetary payoff. But it is widely acknowledged that decision makers often face predicaments where there are conflicts in value deriving from commitments to different professional and social roles, different moral principles or aesthetic values. Such conflicts can induce on the same set of feasible options different weak orderings. It seems no more acceptable here to suppose that an agent will always be in a position to justify one resolution of the conflict over another before taking a decision than it is in Allais's problem. Sartre's example of the son torn between filial devotion to his mother and commitment to the Free French cause illustrates the point. Unlike Sartre however, I contend that it is quite as untenable to regard his decision as a resolution of the conflict as it is in Allais's problem. The son need not regard his decision to join the Resistance as for the best all things considered. He could and, perhaps, should see the conflict in his values as unresolved even though he had to take a decision. The fact that one conflict (in Allais's problem) is pecuniary and the other moral does not seem especially relevant.

I argued originally that conditions of rational belief, valuation, and decision ought to be applicable to all agents whether they are animal, automaton, human, or social. The discussion immediately preceding supports the contention that agents need not betray their rationality by taking decisions under unresolved conflict. The examples were taken from decision making by personal agents but,

according to the first argument, ought to apply to social agents as well.

Ironically, Arrow's impossibility theorem itself offers a compelling case for concluding that social agents may retain their rationality while taking decisions under unresolved conflict just as personal agents do.

Arrow's requirement of nondictatorship on "social welfare functions" that specify how conflicts between the values of the individual citizens are to be resolved in social preference precludes recommending that society follow the practice of resolving conflict by adopting the ranking of some designated citizen. And his proscription against appealing to interpersonal comparisons of values precludes adopting any other ranking compatible with Pareto conditions, "independence" requirements, and the condition that the social welfare function be defined for all possible preference profiles.

The net effect of these Arrovian conditions is to rule out any potential resolution of the conflict between the welfares of different citizens from representing social preference.[14] That is to say, these conditions preclude society from resolving such conflict. Arrow gets a contradiction by insisting that society resolve conflict anyhow. But if it is conceded that decision making under unresolved conflict may be rational for social agents as it is for personal agents, Arrow's insistence on endorsing the requirement that, for any system of individual preferences or welfare rankings of the social states, a ranking representing social preference should be determined may be abandoned.

To be sure, the Arrovian result remains troublesome even when the requirement that social preferences be free of conflict is abandoned. It is one thing to say that society, like a person, may sometimes be justified in taking decisions without having resolved all conflicts. But it is quite another thing to impose conditions on social valuation which prevent resolution of any conflict.

I, for one, remain unconvinced that interpersonal comparisons are always to be avoided. And, in certain classes of decision problems, society may be justified in adopting a dictatorial rule—or, at least, in restricting resolutions to preference rankings belonging to

[14] These remarks are a rough characterization of the insight expressed by R. D. Luce and H. Raiffa in *Games and Decisions* (New York: Wiley, 1958), pp. 343-345, in their discussion of how an argument due to Blackwell and Girshick [*Theory of Games and Statistical Decisions* (New York: Wiley, 1954), p. 118] pertaining to individual choice under uncertainty could be adjusted to yield the Arrow impossibility theorem. Paul Lyon and Teddy Seidenfeld drew this to my attention independently of each other.

members of some oligarchy. Nonetheless, society often may lack a warrant for making interpersonal comparisons and for favoring the values of some privileged group of citizens. In such cases, society should be prohibited from adopting any ranking of the social states as a basis for maximizing behavior.

Thus, Buchanan is right at least to this extent. Society should not *always* be thought of as a preference-maximizing agent. But, counter to Buchanan, the trouble with Arrow's insistence that social choice maximize preference according to some social preference ranking is not that social institutions fail to qualify as agents whose choices are subject to critical assessment according to the same canons of rational valuation and choice applicable to persons. Social groups ought often to be treated as agents just as persons ought often to be treated as agents, and we should devise our approaches to rational choice with this in mind.[15] But just as personal agents may terminate deliberation and take decisions without having resolved the moral, political, economic, and aesthetic conflicts relevant to their predicaments, so too social agents committed to promoting the welfares of their clients or citizens might justifiably make decisions without settling on how to balance the competing interests of these clients.

It is often alleged that the chief difference between "pure" or "theoretical" scientific inquiry and practical deliberation is that in practice but not in science the need to make decisions deprives the deliberating agent of the luxury of remaining in suspense even when there is no warrant for settling outstanding issues one way or another. Curiously enough, some pragmatists (e.g., Charles Sanders Peirce) seemed quite prepared to accept such a dualism between theory and practice. An alternative pragmatist response is to assimilate theoretical inquiry somehow to practical deliberation in a manner that denies to pure research, as it does to practical deliberation, the opportunity for suspension of judgment. My own brand of pragmatism agrees that scientific inquiry is a goal-directed activity subject to the canons of criticism regulating all practical deliberation. But the need to take decisions (which, in my view, is as urgent in pure research as it is in practical deliberation) does not mandate or even excuse unjustified resolution of conflict or leaping to conclusions. My aim in this paper has been to indicate how

[15] An important recent effort to develop decision theory applicable to both social and personal agents has been undertaken by Paul Lyon, *Preference Aggregation*, unpublished Ph.D. dissertation, Washington University, St. Louis, 1980.

this brand of pragmatism bears on "rationality" assumptions built into the conditions that entail Arrow's impossibility theorem.

ISAAC LEVI

Columbia University

COMMENTS AND CRITICISM

FREQUENCY-DEPENDENT CAUSATION*

Smith has a certain physical constitution; smoking can cause him to get lung cancer. Jones, however, is not susceptible. When Smith smokes and gets the disease, we might wonder what it means to say of him that his smoking caused his cancer. But different sciences also have an interest in generalizing over the individuals in a population and arriving at a population-level causal claim; smoking, we have found, causes lung cancer in the population of U.S. adults. If the population includes susceptible and nonsusceptible individuals alike and if some individuals smoke but others do not, what could be involved in a population-level hypothesis about the causal role of smoking?

Ronald Giere[1] has recently provided a counterfactual analysis of such claims. One part of his account is designed to cover populations of deterministic systems; the other is intended to handle populations of stochastic systems. If Smith is a deterministic system, then it will be a matter of physical necessity that, if he smokes, he'll get cancer. If, on the other hand, Smith is a stochastic system, then his smoking won't physically necessitate his getting cancer. Rather, his probability of getting cancer if he smokes will exceed his probability of getting cancer if he doesn't. The first clause of Giere's analysis is that, if smoking causes cancer in a population, then there must be at least one individual in the population who is either a deterministic or a stochastic system with respect to the occurrence of cancer, given smoking.

The second condition of the analysis instructs us to compare two

*This paper was written under grants from the John Simon Guggenheim Foundation and the University of Wisconsin Madison Graduate School, which I acknowledge with thanks. I am grateful also to the Museum of Comparative Zoology, Harvard University, for its hospitality during 1980–81.

[1] In *Understanding Scientific Reasoning* (New York: Holt, Rinehart & Winston, 1979) and in "Causal Systems and Statistical Hypotheses" in L. Jonathan Cohen, ed., *Applications of Inductive Logic* (New York: Oxford, 1980).

0022-362X/82/7905/0247$00.70