THE NATURE OF THE COMMODITY 'HEALTH CARE' AND ITS EFFICIENT ALLOCATION[1]

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SINCE economists began to turn their attention to matters concerning the efficient allocation of resources devoted to preventing, curing, and alleviating ill health round about the end of the 1950s, a whole new area posing intriguing new questions has been opened up. Many of the most fundamental of these problems have yet to be cleared up (for example, the definition of the 'product' of health care institutions and how it may be measured). The purpose of this article is to attempt to resolve just one of these difficulties, namely, whether the commodity 'health care', defined generically as the kinds of service provided by surgeons, physicians, nurses, hospitals, etc., is *different* from other commodities in particular and crucial ways such as to make some forms of organization of the health industry *intrinsically* inefficient and others intrinsically efficient. As is well known, this question has been the subject of frequent controversy over the last twenty years, a controversy that is today as lively as when it began, but a controversy, it is hoped to show here, that has been largely unproductive because it has been characterized on both sides by a surprising propensity to leap from certain interesting (and important) descriptive characteristics of health care to conflicting (and again important) policy prescriptions.[2] What is even more surprising, most of this discussion has been conducted at an entirely *a priori* level with the practical conclusions being inferred in an *ad hoc* fashion, without a proper logical foundation. One reason for this may be that an explicit social welfare function has rarely been stated, though some contributions have been cast in a Paretian welfare economics mould.[3] There are, however, other more powerful reasons why different analysts' conclusions have not been the same, and it is upon these that we shall concentrate.

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[2] Some of the particularly influential (both within and outside the economics profession) have been contributions by Arrow [**1**], Clark [**9**], Feldstein [**15**], Klarman [**23**, pp. 47–56], Mushkin [**35**], Titmuss [**42**], and Weisbrod [**44**], on the one hand. On the other, with a 'pro-market' inclination, if it may be so characterized, have been Lees [**24**] [**25**] [**26**] and the Jewkeses [**20**] [**21**] in particular. More cautious analysts include Buchanan and Lindsay [**30**] [**31**].

[3] Especially Arrow's [**1**] and Lindsay's [**30**]. One conjectures that some at least of the differing views would explain the existence of the institution of which they disapproved as evidence of irrationality. But that is very unscientific and inconsistent with the corpus of economic analysis. For a recent attempt, and the only one to date to 'explain' the NHS, see Lindsay [**30**].

A major purpose of this article is therefore to attempt to evaluate the policy implications that have been drawn for the appropriate organization of health care in terms of the Pareto criterion; i.e. changes which improve someone's welfare without placing a net harm on anyone else are deemed an improvement, while changes that yield net benefits to some and net harms to others cannot be evaluated in terms of whether society as a whole is better off.

Current orthodoxy is adequately summarized in an early article by Martin Feldstein in this journal: 'the availability of private health insurance does not remedy the most basic defects of the market mechanism as a method of providing health care. Although it can permit some people with adequate foresight to escape from the precariousness of major medical expenses, . . . if medical care is allocated according to the patient's financial position rather than his medical condition, the nation's health-care resources will not be used as productively as possible' [**15,** pp. 22–3)]. The major reasons why this may not come about will be discussed later, but the diligent reader of the *a priori* health economics literature will search in vain for a clear alternative objective function. Feldstein, to be sure, in the article mentioned does ask '. . . should not health care be allocated to maximize the level of health of the nation instead of the satisfaction which consumers derive as they use health services?' (loc. cit.).[1] But even supposing that a satisfactory measure of the nation's level of health existed, the unconstrained maximization of such a level is an absurd objective since it seems unlikely that the stage of negative (or zero) marginal returns would be reached short of incredibly large investments in health. Not that Feldstein suggests this objective, for he later prescribes that 'in making their decisions, doctors and health-care administrators should look for the *optimal* use of resources by weighing the benefits and costs of alternative programmes and methods of treatment' [**15,** p. 25], and, indeed, much of his own subsequent work has been directed toward helping them to do just that. But a dilemma still exists, for if individual preferences are not to be counted, what are the benefits and costs to be weighed? If some benefit is foregone, no matter who loses it, is not a social cost incurred to the same value? It matters little whether the difference between benefits gained and necessary production costs is maximized, or whether production costs plus all *other* foregone benefits are minimized, optimal consumption remains the same since it is, quite rightly, independent of the accounting conventions used. By a roundabout route, therefore, it

[1] In theory, it is clear that neither the market nor the NHS-type institution is presumptively superior in achieving objectives, such as the satisfaction of some technically determined 'need', other than economic efficiency, see Cooper and Culyer [**10**]. In this paper, however, the maximization of social welfare according to indications given by the Pareto criterion is emphasized.

seems that the Pareto criterion may have been implicit in economists' analyses all the time. But if this was the case, the qualitative arguments for and against various market structures, as compared with the quantitative arguments for improving the workings of extant institutions, are without a logical foundation. This is partly because of a nirvana approach to the problem, i.e. comparing the actual operation of an existing system with the hypothetical operation of an ideal system (see Demsetz [**14**]), but also partly because of a failure by some commentators to recognize that organizational reforms cannot abolish economic problems, though they may change their form.

II. The characteristics of health care

There can be no doubt that health care is not the same thing as other economic goods. It has, moreover, some intriguing characteristics which appear to make for conceptual difficulties in defining the nature of an optimal allocation. Some are shared with education, another good frequently provided publicly, for example the direct involvement of the consumer in the production process and the difficulty of separating out consumption and investment elements and the very substantial cost that may fall on individuals giving rise to major distributional problems. Others, however, are probably unique in the extent to which they apply to health care compared with other goods or services. The purpose in this section is to examine these for the evidence they provide for public or private provision of health care.[1]

Consumer rationality

Welfare economics makes two crucial assumptions regarding consumer rationality. The first is the normative judgement that the individual's own interpretation of his own welfare is the one that counts. The second is the non-normative (but also untestable) assumption that choices reveal preferences. Our purpose is neither to defend nor criticize these assumptions but to discover whether health care characteristics conflict with them.

Three arguments concerning rationality have been put forward which are alleged impediments to the optimization of welfare in open markets for health care. These are:

(*a*) many consumers, though sick, do not desire treatment and may even be ignorant of their sickness;
(*b*) the mentally sick fit oddly into a 'consumers' sovereignty' model;
(*c*) patients requiring emergency treatment are frequently not in a position to reveal their preferences.

[1] Itemizations of the peculiar characteristics of health care are to be found in Arrow [**1**], Klarman [**23**], and Mushkin [**35**] among others. Boulding [**4**] provides an interesting discussion of the need for care.

1. The first of the alleged impediments has been well documented. Spectacular evidence for the truth of this proposition was discovered in the famous 'Peckham experiment' of 1935–9, where 64 per cent of the persons examined had identifiable disorders but were unaware of them. In 1964, for example, it has been estimated that there were 150,000 unknown diabetics in Britain.[1] It also appears that the problem has similar dimensions in other countries. Such evidence appears to violate a fundamental and necessary condition for the attainment of an optimum through open markets. Such an inference, however, neglects two important problems. First, the problem of ignorance is not a problem characterizing markets only. Knowledge must be economized in all social systems, and by using patient ignorance as a stick with which to belabour private medicine, attention is diverted from the more important problem of assessing the *optimal* amount of ignorance. There is little evidence that post-war British patients are any less ignorant of their state of health than their pre-war parents were or that a nationalized health care system devotes more resources to preventing sickness than other systems (Office of Health Economics [**37**]). This, of course, is not evidence for or against the efficiency of any particular system of provision, but it is evidence for the view that the description of a theoretical optimum does not tell one how it may be achieved. Secondly, the inference ignores the possibility that the degree of ignorance measured in experiments such as that at Peckham may, in fact, be optimal. If information about one's health is costly to collect, it may be irrational to dispel all ignorance; i.e. it is perfect information rather than ignorance, that is *a priori* more likely to be inconsistent with the postulates of welfare economics. The fact that one set of individuals sees a social benefit in reducing the ignorance of others is a problem of externalities, to which we shall return later, but it does no damage to the conclusions here that the observation of ignorance is not sufficient to infer inefficiency in resource allocation and that the specification of an optimal distribution does not indicate the most appropriate form of social organization for attaining or approaching that optimum.[2] What is required if a specific institutional arrangement is to be changed is a behavioural theory of how individuals operating within the framework of constraints implied by that form of organization can be expected to act compared with their behaviour under an alternative form. This, however, is a problem of

[1] See Israel and Teeling-Smith [**19**], and the references cited therein.

[2] This is viewed as a problem in externality theory since it seems clear that for any behavioural result to appear, those who are 'too' ignorant or myopic must in some way affect the behaviour generating function (i.e. the utility) of another set of individuals. The latter usually describe their resulting behaviour as being in the interests of the former, which it may indeed be (Culyer [**12**]), though there are some difficult conceptualizations required in order to show this and it may be almost impossible in practice to distinguish such cases from others involving outright coercion.

positive economics, to which attention has only relatively recently been turned, and to which a satisfactory answer has yet to be reached.[1]

2. A similar conclusion must hold with regard to patients who, though knowing that they are sick, fail to demand treatment. Given their preferences, information, fears, etc., there is no *a priori* reason for supposing that they are behaving irrationally, nor that they would behave differently under an alternative system. On the other hand, if there exists another set of individuals who would prefer them to receive more care than they choose, then there may again be marginally relevant externalities which should be taken into account in describing the nature of the optimum. The point here, however, is not that the individuals in question are behaving irrationally, violating any of the postulates of utility theory by, for example, acting inconsistently with their own preferences, but that they are behaving inconsistently with the preferences of an entirely different set of individuals.[2]

3. Similar conclusions hold with respect to the emotionally disturbed, children, and emergency cases. If there is evidence that these individuals are actually behaving irrationally or are not in a position to choose, then it must follow that welfare economics, based as it is on an assumption of rationality, has nothing at all to say about their subjective utility maximization. It cannot therefore be used to assess alternative forms of provision. On the other hand, welfare economics can be used to describe the characteristics of an optimum if there exists an *external* demand for the care of such people. Since the problem of external demands emerges as a general problem in health economics its discussion is, however, postponed until a later point in this paper. It is, however, dangerous to overstate the degree of irrationality in the behaviour of patients, and the discussion here is not intended to lend support to any presumption that individuals, even those who are emotionally disturbed, are in general irrational in matters of personal health care.[3]

Uncertainty[4]

Four points in particular have been raised, which may affect the ability of an open market to satisfy the necessary optimal conditions, all arising

[1] For some attempts in connection with the medical care industry see Newhouse [**36**] and Weisbrod [**46**]. For a different context (universities) see Culyer [**13**].

[2] See p. 192, n. 2.

[3] In some cases, especially in emergency care, where the demand curve is quite inelastic and the costs of the appropriate treatment not 'too' high, it seems quite reasonable to assume that others may make proxy decisions, where the individual in question cannot do so himself, without fear of severe welfare losses anywhere. Such is implicit in the Hypocratic oath and is common to *all* medical care systems. It is a matter (almost) entirely apart from the externality question.

[4] The major items in health economics literature on uncertainty and insurance, chronologically, are Arrow [**1**], Lees and Rice [**28**], Arrow [**2**], Pauly [**38**], and Crew [**11**].

from various aspects of patient uncertainty about various dimensions of health care services.

(*d*) Patients frequently will not be able to calculate the cost they will incur in receiving medical treatment;
(*e*) they are frequently ignorant about the quality of the care they receive;
(*f*) fair insurance may not be obtainable; and
(*g*) moral hazard prevents an optimal insurance pricing structure.

4. Consumers who seek medical care usually do so before they know how much cost they will be incurring. In the face of this uncertainty it is clearly possible that they may take decisions which subsequently they may come to regret. They may, for example, take too much care and discover they have run up a bill higher than they would have been prepared to pay before consultation; or they may take too little if they overestimated the probable cost and the appropriate treatments are highly indivisible (e.g. having embarked upon a cheap course, an expensive and more effective course would add too much to the cost given the wealth effects that have already happened as a result of treatment already received; or that alternative courses are mutually incompatible, e.g. having embarked upon a cheap course the expensive course would not be medically feasible). Partly, the problem here is one that has already been met, namely how one can tell whether the optimal amount of information about the relevant choice parameters has been obtained. Under a zero pricing system, such as one may imagine the 'ideal'[1] National Health Service to be, the optimal amount of information about direct costs for any patient to collect will normaly be zero, since the costs of his choices are spread over the whole of society and the burden upon him is effectively zero, though the collective burden of the decisions of the rest of society clearly is not zero. In this system, the cost of care falls on an individual not as a result of his own individual choices but as a result of the choices of others through the payment of a (hidden) tax-price. The result of society-wide risk pooling is thus to reduce to negligible proportions the incidence upon him of the costs implied by his own choices while reducing to quite a low level the uncertainty about the costs that will be thrust upon him by the rest of society. The 'ideal' NHS system may therefore appear to have two major built-in allocative inefficiencies. The first of these derives from the pooling element. As Arrow has shown, insurance requires a maximum degree of risk discrimination for its full social benefit to be realized, while pooling implies no discrimination. Thus, under conditions of uncertainty, options on

[1] The 'ideal' NHS is characterized by zero pricing for all health care services, public ownership of all non-human inputs, and general fund tax-financing.

future consumption would be purchased some of whose expected benefit exceeded expected cost at the margin (where the premium exceeded actuarially predicted cost) and some of whose expected benefit fell short of expected cost at the margin (where the premium was less than the actuarially predicted cost) (Arrow [**1**]). The second derives from a zero price implying excess demand and a failure to satisfy the necessary condition that expected marginal valuation should equal marginal cost. Neither of these two objections, however, can be regarded as sufficient to show the *relative* inefficiency of the NHS. First, the maximum discrimination requirement is a condition relating to a hypothetical world of zero transaction, contract, and information costs. All real world institutions have degrees of pooling built into them as a means of economizing on the costs of collecting enough information for the 'correct' premiums to be found. The comparison is properly one between different conceivable real world institutions, where second-best solutions must be discovered. At least, such solutions may be second-best by comparison with a hypothetical ideal, but they may be first-best in terms of what can actually be done. This is clearly not a matter to be settled by *a priori* reasoning since the correct degree of pooling depends upon the costs of administering various pooling/discrimination mixes—an empirical matter. There is also an alternative argument which asserts that pooling as under the NHS is actually more efficient than risk discrimination. Risk discrimination requires that individuals in groups having a higher incidence of sickness should pay higher premiums since they impose higher social costs. With pooled risks in the NHS, however, the premium takes the form of a tax-price which, to the extent that the NHS is financed out of general funds and the tax-system is progressive, divorces the premium from the individual's risk and relates it instead to income. Since the poor would tend to be less discriminated against under this system than one in which risk discrimination was the rule, there may be some social benefit from such a form of organization relative to one in which pooling was less prominent. This argument is an important one to which we return later. At this point, however, it is observed that whatever merit the argument may have, it is not related to the matter of optimizing cost uncertainty. Instead it concerns the incidence of absolute costs. It is therefore not relevant to the discussion of this section.

The second objection to the NHS system is also derived from comparing the real world with a hypothetical ideal instead of a realistic, or conceivable, alternative. In any known health care system, however, there is some response to the problem of the uncertainty of costs which incorporates insurance or pooling elements by which all fail the test of comparison with a hypothetical ideal. The reason for this is that so long as the tax-price (or premium) does not exceed the expected value of consumer's surplus,

the operation of a zero price for *use* of the service (as under the NHS or even a full insurance system with risk discrimination) will ensure that individuals will, under either type of institution, try to adjust so that their marginal valuations become zero. Any differences between alternative institutions must arise because of differences in behaviour that are implied about how individuals can adjust by, for example, coinsurance in the market, or by political voting processes in the NHS case, which reduce total supply below the rate of consumption implied by zero marginal valuations. These are, however, more or less empirical questions about the *processes* by which preferred positions are attained and have very little to do with the specification of an optimal solution. Before a judgement about the relative merits of the market or the NHS can be reached one therefore requires far more information about these processes and about how the excess demands under either institutional framework are *actually* removed. Currently, we lack even a satisfactory positive theory of managerial behaviour as a framework in which such an empirical investigation could be conducted.[1] Thus, at the microeconomic level, one's preference for one system or another will depend upon how resources in excess demand are actually rationed out. Since a prime health service supplying agency, the hospital, is characteristically non-profit in either system, there must be substantial initial uncertainty about any behavioural differences between them, which further whittles away any *a priori* case favouring either one over the other. This problem is additional to another concerning the determination of the *size* of the excess demand, which in the case of the NHS requires some theory of public expenditure (since marginal valuations are not, in practice, equated with zero) and in the market case requires analysis of the means used to reduce the effects of moral hazard.

5. Uncertainty about the quality of care received by consumers is more important in the health services than in many other areas of economic life, since the patient is frequently prevented, in the nature of his case, from shopping around and learning about the quality of the service of rival suppliers by trial and error. Even if second opinions are feasibly obtainable, as they frequently are, the patient may not be able to weigh one against the other. The typical case, however, is probably that second opinions are obtainable but that they are not sought because of the mystique associated with the medical profession and the assumption that 'the' doctor knows best. The difference in the amount of information available to doctors on the one hand and to patients on the other is not of the same type as occurs with most other goods and services. Typically the producer knows more about the technical methods by which a product (in this case, say, a course of

[1] But see the references cited in p. 193, n. 1. Reference 13 has some further references of a more general kind.

treatment) is supplied. In the case of medical care, however, an additional differential exists in that the doctor will usually also have a substantially greater idea of the usefulness to the patient of alternative 'products', whereas with other commodities the consumer is presumed to know this better. As the purveyor of a service, this puts the doctor in a special position since he presumes to tell the patient what he needs as well as supplying those needs. In an ideal world, as Arrow has pointed out [1], one can conceive of devices which would enable such risks to be insured optimally. One possible scheme[1] would be to pay doctors by results so that they had an appropriate incentive for using their superior information as efficiently as possible, with doctors transferring the risk of failure to insurance agencies. The reasons why such mechanisms do not operate are, however, easy to identify. The major one must certainly be the enormous costs of discovering whether treatment had been 'successful'. How successful is a treatment that saves a person's life but renders him permanently disabled? How does one measure a treatment that relieves, but does not eliminate, a particular set of symptoms? How successful is a treatment that prolongs a life for two months, or three, or four? Instead of this kind of mechanism for reducing the costs of uncertainty for the patient, most societies have evolved what is usually called 'the doctor–patient relationship', the special trust relation between doctors and patients which gives the medical profession a high social status in the community as trustworthy and impartial. It is the same ethic, one may argue, that calls for an absence of any obvious commercialism in the physician's dealings with his patients. It is an ethic which is as old as Hippocrates, and one which appears to be commonly shared across different societies and across different institutional frameworks, in both the market-type health systems and the NHS. Whether a periodic bill from one's family physician or the periodic spectacle of an entire profession threatening disruptive action in support of a pay claim is more conducive to this special relationship is difficult to say, and there seems to be no obvious grounds for *a priori* choice between alternative institutions here.

6. A common complaint against health care that is organized in a market is that actuarially fair insurance is not available, apart from the problems due to pooling elements, because charges are loaded by administrative costs. Clearly, if marginal social costs are incurred in administering insurance a price for insurance which ignored them would imply a state in which social welfare could be increased: assuming a negative sloped demand curve for risk avoidance, too many people would be insured. The absence of an actuarially 'fair' price cannot therefore be held to be an inefficiency of the market save in comparison with the hypothetical ideal world where

[1] Suggested by Arrow, op. cit., p. 964.

administrative costs are absent. The existence of self-insurance is not a sufficient condition for sub-optimality. The relevant comparison is, as has been emphasized above, between conceivable real world institutions. In practice, one suspects that a pooling system with compulsory membership will provide lower unit administrative costs than a voluntary risk-discriminatory insurance system, though the matter is an empirical one and one's suspicions are not always well founded. The problem is more complicated than this, however, since both compulsion and pooling imply social losses to be offset against any cost reductions, so the conceptual argument is less unambiguous than might appear and the empirical exercise would involve some quite heroic cost-benefit efforts.

7. The problem of moral hazard, which has previously been alluded to, arises with some forms of insurance because the consumer of medical care is confronted with a marginal cost at the point of receiving care that is less than the true marginal social cost of provision, hence leading to some loss of welfare. If an individual would consume X 'units' of medical care if he contracted a particular sickness (and had to pay the full cost) his behaviour changes when he insures against the costs, whatever they may amount to, of that contingency. Ignoring transaction, etc., costs, with unit costs of providing care at c, he might expect to pay an actuarially fair premium of $p(cX)$, where p is the probability of falling sick. Being insured, however, the marginal cost of further treatment (e.g. more days convalescing in hospital, more physican visits, hiring a more eminent physician) is zero to him, leading him to consume X' 'units' of care where $X' > X$, at a cost to the insurance company of $p(cX')$, assuming constant costs per unit of care. The actuarially fair price therefore rises, leading to a reduction in the number of insured persons, i.e. an increase in the number of uninsured risk-averse persons. In addition, each insured person incurs a dead-weight loss on all extra-marginal units of care consumed beyond the point at which marginal valuation equals marginal social cost. The problem is similiar to that faced by the NHS-type organization, which has zero user prices and which satisfies demands in excess of the optimal amount. There are, however, differences in the way the two types of system distribute their excess burdens. In the market, the excess burden can be avoided by self-insurance, but the self-insured also lose, of course, by virtue of being confronted with a range of premiums which, although they may reflect the full social costs incurred by the insurance company, do not reflect the lower premia that would exist if moral hazard were absent. In the NHS the excess burden is incurred by all.[1] It does *not* follow that because the market permits individuals to escape the excess burden (though at a cost)

[1] And some individuals' dead-weight utility loss may exceed, with compulsory 'insurance', the utility gain from risks avoided.

the NHS is inherently relatively inefficient compared with a market system, since both types of system have developed mechanisms by which moral hazard can, so to speak, be economized. In the market, for example, a fixed indemnity scheme places a limit on the extent of any dead-weight loss from moral hazard; a policy containing deductibles, in which the insured person agrees to pay for the first X units of care, will affect the moral hazard in consumption beyond this level only to the extent that the payment of the deductible has an income effect on his demand, so long as net consumer's surplus remains positive,[1] but it will reduce insurance prices; coinsurance, under which the insured person contracts to pay some proportion of the costs of care, will reduce, though not normally eliminate, moral hazard through substitution and income effects; prepayment removes the moral hazard altogether. In the NHS, the mechanism is effectively almost equivalent to the fixed indemnity type of insurance policy with, however, the amounts to be supplied in any contingency being taken altogether out of the hands of the individual patient and decided by the medical profession working within the resource constraints determined by public policy. While there is far less freedom for an individual to adjust in the way he most prefers under the NHS type system,[2] it does not necessarily follow that his net position is inferior since the total social dead-weight loss incurred depends on how effective these various methods, and combinations of methods, are at minimizing it. As before, the *a priori* argument could go either way.

One thing, however, does seem clear: it is most unlikely that full insurance of all uncertain medical expenses can be optimal. The market economizes on moral hazard by offering a variety of different contracts at different prices; the NHS economizes with a variety of non-price rationing devices. In both systems moral hazard is present in unknown degrees.

Externalities

The final set of characteristics of health care that may have implications for the form of organization suitable for producing and distributing the services are all conveniently grouped together as problems of external relationships. These are:

(*h*) cases of communicable diseases where the benefit from an individual's immunization accrues to others in society beside himself (or alternatively, the external costs of not being immunized);

[1] Assuming health care to be a superior good.

[2] Third-party control of the rate of consumption when an insured individual falls sick is not, of course, restricted only to the NHS. Market forces in the U.S.A. are also supplemented by institutional controls by insurance agencies.

(*i*) the problem of ensuring that sufficient capacity is available for those who do not currently require, say, hospital beds but who value the existence of capacity sufficient to ensure them a place should they require it at some later date;

(*j*) finally, and possibly most important in health care, is the problem alluded to previously concerning individuals who, though possibly behaving perfectly rationally, may not consume sufficient health care in the opinion of other individuals in society. This may arise either because of a low income level or because of uninsurability due to chronic and costly illness, or for other reasons such as myopia, social milieu, or any of the many factors that shape a person's preferences and circumstances.

8. The problems involved in the case of communicable disease and other environmentally harmful effects fall into the well-understood category of events known as physical externality. They are twofold. First is the question of how to internalize a marginal external diseconomy such as may be imposed, by an individual's failure to be immunized, upon the rest of society in the form of a higher probability that they will contract the disease. Second, there is the problem of who should pay for the marginal (public) benefit produced when a suboptimal situation is rectified. There appears to be general agreement among economists that this activity is most appropriately subsidized under government auspices and financed out of general taxation.[1] This solves the free-rider problem[2] while at the same time reducing, usually to zero, the user cost of the service and hence encourages its use. When coupled with various non-price rationing devices, such as restricting the subsidized service to particular classes of the population, especially those that are particularly at risk, there seems to be a consensus that a practical approximation to the optimum is attained. It is noteworthy, however, that this is a shared judgement about the facts of the situation, and there are cases of public health policy, especially where the externality relation is confined quite closely in a geographical location, where it may plausibly be argued that private initiatives in the market eliminate relevant marginal externalities. Again, therefore, the *a priori* case is inconclusive and the fact that this area of health economics has been relatively free from a prioristic controversy may fairly be attributed to the

[1] See, for example, Lees [**27**], Weisbrod [**44**].

[2] The 'free rider problem', called on p. 205 'prisoners' dilemma', refers to a situation in which each individual would reach a privately optimal situation if others provide the public good or service while he enjoys a free ride: i.e. fails to contribute to the cost while still enjoying the benefit. Even if he recognizes that the same situation faced by each individual will imply zero production of the public good and he joins in some cost-sharing voluntary contract with other potential beneficiaries, he faces an incentive to break the contract.

contexts in which most of the discussions have taken place, that is within wealthy developed countries of fairly dense population and efficient communications networks. When dissident voices have been raised the context has been within less developed countries where a realistic bound can be set on the geographical extent of the externality, for example a malarial swamp containing or adjoining a rubber plantation but surrounded by an unpopulated region. In such cases it is clearly possible (though it is not certain) that the costs and benefits of an eradication programme may be sufficiently internal to one commercial organization that a financial appraisal yields a solution that is as satisfactory at the margin as a more comprehensive analysis of all the side-effects (Perlman [**40**]).

9. The problem of ensuring optimal option capacity has been identified only relatively recently in the literature (Weisbrod [**45**]). Individuals cannot be sure when they will require medical treatment and new capacity can be created only in finite time. If, therefore, hospital bed capacity were fully utilized all the time there would be no means of taking additional cases whose demand arises unexpectedly and urgently short of discharging patients early who are already occupying space. Clearly, removing existing occupants to make room for new ones is a method of ensuring the efficient use of existing capacity, and it is one practised in all countries. Equally, however, this procedure has social costs, the avoidance of which constitute a benefit to be set against the costs of providing spare capacity. The criticism of a market mechansim is that one does not pay directly for one's 'share' or 'option' in this capacity and hence the market is likely to provide a suboptimal, though usually a positive, amount. The market, however, is not restricted to trading in the form of fees for specific items of service, which would certainly be an inadequate method (compared with the hypothetical ideal) for producing capacity that was essentially a public good in its technical characteristics, for where potential gains from trade exist between resource owners and potential demanders, there is clearly a motive for either side to invent a mechanism by which such gains may be mutually exploited and shared. Two such mechanisms exist in the market, one being the prepayment method of insurance discussed above, whereby subscribers purchase an option on the capacity of hospitals or groups of hospitals (Lindsay [**29**]), the other takes the form of voluntary charitable activity to assist hospitals in providing more capacity. It does not follow, therefore, that state provision or subsidy is a necessary condition for optimality. The correct policy must be inferred from the actual performance of the current system (whichever it is) in relation to an objectively specified capacity. Qualitative *a priori* arguments give no guide to policy since all the known alternatives appear to supplement immediate demands for use with indirect demands which move capacity in the correct direction, but

one does not know whether they move it far enough, or too far, nor whether one method is less costly to operate than another.[1]

10. At several previous points of the discussion in this paper there was a postponement of the analysis concerning what many, including the present author, will regard as key problems in health economics. The first of these concerned policy toward those who are not 'sufficiently' concerned with their health and those who are too poor to be able to implement any concern they may have by actual consumption. The most common approach to these problems has hitherto been to regard health care as a 'merit' good on the one hand, with 'imposed' choice being implemented in some way[2] and, on the other, to stipulate certain criteria for evaluating the properness of any given income distribution. Both ideas have had troubled histories. In the second case economists have, when discussing allocative efficiency, been careful only to evaluate compensated changes as either social gains or losses because of a general methodological reluctance to introduce interpersonal utility comparisons. When the question of income distribution arises a separate criterion is used clearly involving such comparisons and conceptually quite inconsistent with the previous approach. For some years welfare economics thus limped along in this uneasy harness. In the first case, that of merit goods, it has now been demonstrated that replacement of voluntary with imposed choice must, in general, cause an uncompensated welfare loss which also cannot be evaluated using the Pareto criterion (McClure [**32**]). More recently, however, it has been realized that all cases of apparent merit wants need not involve uncompensated changes in individuals' positions, for to enable consumption by one set of individuals to take place may, under certain circumstances, constitute a social good for which other individuals may be prepared to pay. In other words, it becomes possible to view some forms of consumption subsidy as a part of a general Lindahl-Bowen voluntary exchange theory of public finance. Similarly, the state of distribution of income may be considered as a social good (or bad), and for the same reason: individuals' utility functions are not independent of other individuals' consumption patterns, nor of the overall level of others' consumption. The development of the formal theory of voluntary distribution, while having some aspects

[1] According to Weisbrod's original argument, one would expect occupancy rates in American hospitals to be too high for optimality. Oddly enough, Titmuss, a stern critic of the North American system of medical care, points to higher occupancy rates in *British* hospitals as compared with American ones as evidence of large-scale waste in the U.S.A. [**42**, p. 254]. In a reply, Lees, a stern critic of the NHS, demonstrated that American hospitals have, in fact, the higher occupancy rate and thereby lent support to the inference to be drawn from Weisbrod's (chronologically later) paper! (Lees, [**25**]). The rates in both countries have been around 80 per cent during the last decade. For some intensive econometric study of the British data on occupancy, length of stay, case-mix, and utilization of capacity, consult M. S. Feldstein, *Economic Analysis for Health Service Efficiency*, Amsterdam, 1967.

[2] See Musgrave [**33**, pp. 6–16], Head [**17**].

that are dissimilar from the usual externality analysis, is in principle not different. It is even possible to merge the theory of merit wants and of voluntary redistribution by viewing the taxing (or prohibition) of some demerit goods as a *quid pro quo* offered the relatively rich in exchange for whatever redistribution is agreed at the political level.[1] In these ways, the range of problems that can be analysed with the Pareto criterion is widened as well as a whole new range of possible applications of positive economics being opened up. One is no longer required necessarily to work with mutually inconsistent normative assumptions in order to discuss important issues such as the welfare of the poor, and the range of problems in which personal preferences of the economist are more prominent than the relatively neutral Paretian prescriptions is narrowed.

This approach requires the dropping of the assumption of selfishness in human behaviour, with alternative institutions analysed in terms of an assumption of altruism, or interdependent utility functions.[2] In particular, assume that of two classes of individual, rich and poor, the relatively low consumption of health services by the poor in the open market imposes external disutilities on the rich.[3] A two-person Marshallian model can assist in setting out the essence of the problem.[4]

[1] The theory of Pareto-optimal income distribution is developed in Hochman and Rogers [**18**] and Musgrave [**34**]. The same conceptual approach is applied to merit wants in Culyer [**12**] and to health care by Cooper and Culyer in a forthcoming textbook of health economics.

[2] Selfishness in this context is defined to mean utility functions of the form $U^A = U^A(a^A, b^A, ..., z^A)$; $U^B = U^B(a^B, b^B, ..., z^B)$;... . Altruism implies utility functions of the general form $U^A = U^A(a^A, b^A, ..., z^A; a^B, b^B, ..., z^B; a^C, ...)$; $U^B = U^B(a^B, b^B, ..., z^B; a^A, ..., z^A; a^C, ...)$; ... .

[3] The textual discussion of interdependent utility functions is couched expositionally in terms of the 'rich' and the 'poor', terms which are intended, however, as portmanteaux, representing also relationships between the 'sensible' and 'foolhardy', rational and irrational, etc.

[4] Three observations are in order to avoid confusion and to spotlight one limitation of this approach. The first is that a two-person model is as satisfactory a method of handling the problem as any partial equilibrium framework of analysis. The model enables distribution, in money or in kind, to be analysed between the two as a familiar 'gains from trade' problem. In generalizing from two to n persons, however, the model does not permit normative analysis of the preferences of any third party regarding distribution between any two. If A and B voluntarily redistribute between themselves, C may receive an external benefit, but cases where C prefers more redistribution than A and B are mutually prepared to effect cannot be evaluated unless C compensates A and/or B for any welfare loss they may suffer in satisfying C's preferences. Secondly, redistribution between A and B will occur only if the one (usually, presumably, the wealthier) receives an external disutility from the other's condition. If the poorer individual receives an external disutility due to the wealth of the relatively rich person, but the rich individual experiences no corresponding disutility from the relative poverty of the poor man, there is no scope for *mutually* beneficial exchange, nor could any transfers between them be evaluated without invoking interpersonal utility comparisons. Finally, as Lindsay [**30**] has shown, the social good could be analysed in terms of a demand for equality *per se*, rather than, as here, a demand for the raising of someone else's consumption. The major disadvantage of the Lindsay approach is that while it 'explains' the NHS, it appears not to have other implications to provide corroborative evidence of its validity. For some emprical work on equality in the NHS see Cooper and Culyer [**10**], Gough [**16**], and Rein [**41**].

In Fig. 1, MV^A and MV^B are the Marshallian demand curves of A (poor) and B (rich) for units of medical care. If both individuals are selfish, the open market result produces a result where A consumes Ox^A and B Ox^B, with a total demand (= supply) of X. This paradigm of the market must clearly be suboptimal if B thinks that it is unjust that A receives so little care.[1] Denote B's demand for more care for A by MV^B_A. X (medical care)

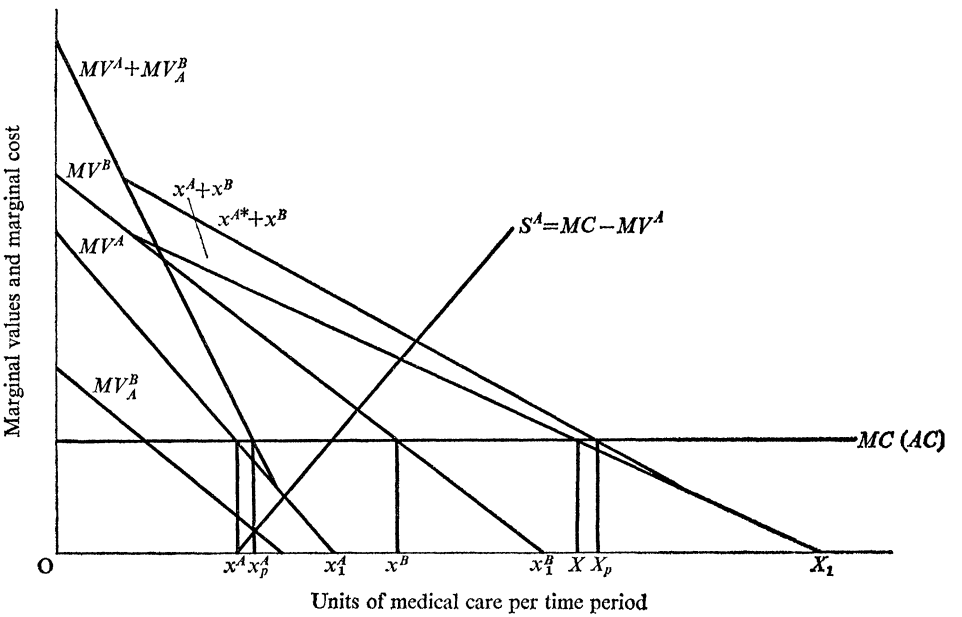

FIG. 1

now takes on public good characteristics in that a unit of X consumed by A is also 'consumed' (indirectly) by B, and society's marginal valuation curve for A's care is now given by the vertical summation of MV^A and MV^B_A. The Pareto optimal amount of A's care is now x^A_p,[2] and the total optimal amount for society is X_p, for the optimum allocation to B remains (in the Marshallian case) x^B. Now it is clear that even in the market place there are various means by which A can induce B to increase his consumption. If

[1] Strictly, if A imposes a Pareto-relevant marginal externality on B. See J. M. Buchanan and W. C. Stubblebine [7].

[2] Pareto-optimal x^A consumption is thus where $MV^A+MV^B_A = MC$. The form of utility function assumed is $U^A = U^A(a^A, b^A,..., x^A,., z^A)$ and $U^B = U^B(a^B, b^B,..., x^B,., z^B; x^A)$, where x is medical care. The general Samuelsonian condition for optimal allocation of a public good is

$$\frac{\partial U^A}{\partial x^A}\Big/\frac{\partial U^A}{\partial a^A}+\frac{\partial U^B}{\partial x^A}\Big/\frac{\partial U^B}{\partial a^B} = fx/fa,$$

where a is the numéraire good and fx/fa is the marginal rate of transformation. $MV^A+MV^B_A = MC$ is the Marshallian equivalent of this necessary condition.

B's utility gain from a rise in A's consumption from x^A to x_p^A exceeds the cost of subsidizing the price necessary to induce A to consume x^A, an across-the-board subsidy is one way. Alternatively, B could compensate A for his marginal losses beyond x^A by offering him bribes to move up the curve $S^A = MC - MV^A$, which is A's 'supply' curve of his own consumption to B, until B is in equilibrium at $MV_A^B = MC - MV^A$, which is an alternative statement of the necessary condition for optimality.[1]

The distribution problem can thus be seen as a problem of internalizing externalities, and the market clearly has means by which charitably inclined persons can assist those less well-off than themselves. The relevant policy question is, of course, whether the market devotes sufficient resources to this end; that is, whether there exists at the current rate of consumption by A any divergence between marginal social value and marginal social cost. Note that at x_p^A, the fact that both A and B value increments in A's consumption positively does *not* imply that he should have more, since no one is prepared to pay for additional consumption—beyond this point marginal opportunity cost exceeds the summed marginal values in use—and the continuing existence of a marginal externality is not therefore a sufficient warrant for further subsidy. Does the market fail? The answer at the *a priori* level is clearly ambiguous. The perfect market clearly will not. By contrast, the 'ideal' NHS, producing a solution where A consumes x_1^A and B consumes x_1^B is definitely non-optimal. In practice the market is not perfect and neither is the NHS ideal, so if the question about the alternative merits of the two is to be resolved, it can be done only by empirical studies, which would involve in many cases impossible cost-benefit efforts, though where substantial divergences between marginal social benefits and costs are suspected general indications of the directions for change may be obtainable.

Perhaps the major difficulty inhibiting the market from satisfactorily internalizing externalities in health care consumption is the prisoners' dilemma that individuals typically find themselves in where the externality is felt by many people. Suppose that a hundred members of the community believe that public harm is inflicted by other people's behaviour which they regard as myopic; and that they each consider the merits of forming a private charity to subsidize some aspect of health care which will be sold at less than cost thereby increasing the consumption of 'myopic' citizens. Each one of the 100 stands to gain £20 worth of utility from the activities of the group, but membership requires each member to contribute £5 if the costs of the programme are to be covered. Each charitably inclined

[1] For further discussion of the welfare economics of consumption subsidies see M. V. Pauly [**39**]. J. M. Buchanan makes extensive use of Marshallian geometry in his discussion of the supply and demand of public goods [**6**].

person clearly may either join or not join the group. Each individual's problem may be set out in the following pay-off matrix, assuming there is a 50 per cent chance in his view that others will join.

		Other individuals		*Individual's expected gain*
		Join	*Not Join*	
Individual	Join	$(\frac{1}{2})\ 20-5 = 5$	$(\frac{1}{2})\ 0-5 = -5$	0
	Not join	$(\frac{1}{2})\ 20-0 = 10$	$(\frac{1}{2})\ 0-0 = 0$	10

With each individual seeking to maximize his expected gain the net result will obviously land the community in the south-east cell of the matrix with the result that the externality remains uninternalized. This, in an extreme example, highlights the inadequacy of private charity. Changing the expected reaction of others will not affect the result, though if each individual believes that his own decision may affect the decisions of others, different results may be obtained.[1] Such, however, might be the situation supposed to exist by supporters of the view that open markets are a less satisfactory way of allocating resources than the government.

The outcome of the private charity case was unsatisfactory since everyone stood to gain from a situation in which everyone else joined the club. Now suppose that the political mechanism is to be used instead of voluntary charity. This introduces two new elements: (1) A group of people who feel no externality and who are opposed to the relief programme, (2) a rule saying that if the majority party favours the programme *everyone* must pay tax to help finance it, so that (assuming an electorate of 500 people) a uniform tax-price of one pound will be imposed. Now consider the problem of the pro-programme individual. With his vote the chances of the pro-programme party winning are, let us assume, 60 per cent in his estimation.

Individual votes for or against pro-programme party		*Pro-programme party*		*Individual's expected gain*
		Wins	*Loses*	
	For	$(20-1)\cdot 6 = 11\cdot 4$	$(0-0)\cdot 4 = 0$	11·4
	Against	$(20-1)\cdot 598 = 11\cdot 362$	$(0-0)\cdot 402 = 0$	11·362

Rational choice for each pro-programme individual is now to vote for the pro-programme party since this strategy maximizes his expected gain

[1] For some conceptual experiments along these lines, consult Buchanan [6] op. cit., chapter 5.

(ignoring the complications arising from his need to trade-off several policies offered in a package-deal by each party). The outcome, however, depends on who gets a majority. If the pro-programme party wins the externality is internalized, but the existence of the minority having also to pay the tax-price imposes external harm on them. Without careful assessment of the facts in actual cases, which will frequently, one may hazard, not be possible, it is not clear whether the gainers could compensate the losers and still be better off. The problem here is that the only valid voting test for Pareto optimality is one based on consensus, yet no rational society will normally choose this voting rule, so *a priori* conclusions again cannot be reached about the desirability of the two methods of organization. The problem has been identified clearly in the literature of 'political economy', where it is well understood that the only valid political rule for testing welfare propositions requires a full consensus of all affected individuals before any change is made (Buchanan [**5**]), yet the theory of constitutions predicts (in its positive form) that the rules adopted for making collective decisions will be various kinds of majority rule, and (in its normative form) recommends such rules to maximize social welfare (Buchanan and Tullock [**8**]). It is possible that a majority decision is not in conflict with one reached by consensus, especially if vote-trading of various forms takes place, but it is not, unfortunately, the case that such decisions must necessarily correspond with the consensus view; hence the agnosticism of a prioristic reasoning.

III. Conclusions

The major omission of this paper has been a discussion of monopoly in the production of health services. The omission is deliberate since it is difficult to see how any useful comparative theoretical discussion can as yet proceed on the workings of monopoly in health services. The reason for this is simple—the typical monopoly in the health field, whether it be a local GP, a hospital, a health insurance agency, or the NHS itself, is characteristically a non-profit organization, and the analysis of such institutions is still unfortunately only embryonic.[1] A policy relevant debate can therefore only begin when a set of theoretical propositions for non-profit institutions comparable with those of the received theory of the firm can be derived. Such a complement to standard theory is clearly

[1] The suggestion by Kessel [**22**] that the medical profession behaves as if it were a price-discriminating, wealth-maximizing cartel is illuminating for some purposes but misleading for others. For example, it does not follow necessarily that the AMA trust should be broken, for reasons suggested by Arrow [**1**] and mentioned above (p. 197). In any case it seems odd, *a priori*, that the presumptively utility maximizing individuals who are private doctors, or who run nonprofit hospitals, should seek to maximize only *one* argument (i.e. wealth) in their utility functions.

necessary if systematic comparisons are to be made of the relative desirability of alternative institutions.

Health care has several characteristics which in their degree and combination make it 'different' from other goods. The conclusion of this article is that an itemization of its characteristics tells us nothing about the most efficient method of producing or allocating it. There are two fundamental reasons for this. First, observation of market 'imperfection' is not sufficient to infer inefficiency even by comparison with the hypothetical ideal. It has to be established whether the imperfection is Pareto-relevant. Second, choice of institutions is never a choice between an imperfect one and a perfect one. Instead, one lives in a world of second best where each case has to be assessed on its own merits. The major reason for this is that the institutions through which resource allocation and distribution are accommodated to individuals' preferences are all costly to operate. On the usual assumption of wealth and utility maximizing behaviour, the explanation of why an open market may have spillover effects, i.e. unexploited gains from trade, must be that the institutions (to define rights, organize contracts, identify persons affected, etc.) required to internalize such effects must be too costly in total terms relative to the value expected to be gained from them. In the real world, therefore, even 'Pareto-relevant' externalities may be inefficient to remove. An open market with externalities is not therefore necessarily 'really' inefficient. But what of publicly owned enterprises? Unless it can be shown that the costs of internalization are lower with this form of organization and, moreover, that they are not accompanied by other inefficiencies, it does not follow that this alternative is superior in welfare terms. But, as we have shown, the public enterprise solution *does* have its own inefficiencies. Furthermore, we do not know what the relative transaction costs are under either institution. Choice between them must therefore be based on quantitative study of these decisive factors. Thus, even if the NHS *is* inefficient, it is not obvious from *a priori* considerations that an institutional change could be made which would increase efficiency. Neither is it obvious, *a priori*, that the market can be improved on by the government taking over production and distribution. Many health economists have overstated their case. The general conclusion, that these matters are fundamentally empirical and, moreover, in many cases quantifiable only in principle, seems to have two major implications. The first is that a far more extensive use of cost-effectiveness and cost-benefit analyses to improve *extant* institutions and to improve understanding of their general efficiency is required. The second is that we need a well-developed positive theory of non-profit institutions from which implications comparable to those of the received theory of the firm can be derived. An

increase in the use of positive economics in this field would be an important step in the right direction if those socially undesirable effects that can be identified are to be removed.

Economic theory enables one to predict with more or less accuracy the consequences of various market institutions for the allocation of resources. By contrast, analysis of allocation under political mechanisms is still in its infancy. One might conjecture that this accounts for two characteristic reactions of economists to the problems raised by suspected non-optimal allocations. On the one hand, knowing much about the ways markets can be expected to operate, the tendency is to seek reform by returning enterprise to the market itself. On the other hand, knowing how imperfectly markets operate, compared with a hypothetical ideal, there is a tendency to suppose that the government could not do it *less* well. If the argument of this paper is correct, neither of these views is tenable. The heady atmosphere of grand designs has to be replaced by the mundane, but ultimately more fruitful, ground of systematically applied economics—cost-benefit, cost-effectiveness, and output budgeting to improve the efficiency of allocation within extant institutions; statistical and econometric estimation of production and demand functions to improve long-run planning and forecasting; and systems analysis and positive economics to assess the consequences of different institutional frameworks of health care. In this scheme of things the role of welfare economics is to provide an appropriate theoretical base on which to build empirical studies and not to prejudge the facts.

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