ject was the relationship between vagrancy and criminal activity. "In the wintertime, the earlier hours of darkness . . . the earlier hours of darkness . . . provide greater opportunity for criminal activity . . . provide greater opportunity . . . opportunity for criminal activity. . . ."

The Future

A common article of faith in the West is that a powerful demand, perhaps an indispensable need, for intellectual and political freedom inevitably accompanies the science and technology that are required for economic and industrial development. In support of this belief, note is often taken of the shaky economic condition of the Soviet Union, where a good number of prominent scientists and academics have long argued that ideological restrictions and police-state tactics are hurtful to the development of a modern industrial society. What relevance does this argument have for political evolution in South Africa, particularly in regard to *apartheid*?

My impression is that it has some, but not very much. South Africa, unlike the Soviet Union, has shown itself to be highly supple in dealing with its academics' insistence, or illusion, that they require intellectual freedom to "do their stuff" for the nation. After all, there is an opposition press, an opposition party with parliamentary representation, a student movement, and Marx is to be found on the library shelf of a "bush college." Those who cannot stomach the atmosphere are either viciously trounced upon, deported, or they quietly leave to work elsewhere. Those who stay are increasingly well rewarded, though as is the case with scientists elsewhere, they frequently contend they are unappreciated. There has been a voluntary "brain drain" in recent years, but its political ingredient is difficult to identify in the worldwide traffic of scientists and engineers who go abroad for professional opportunities or salaries that are unavailable at home. But I was told in many places that with the decline of job opportunities in the United States and Great Britain, and the rapid development of research facilities in South Africa, the "brain drain" has appreciably slowed. In fact, at least half a dozen research administrators reported a sudden and nearly unprecedented flow of applications from American and British scientists seeking employment in South Africa.

But if an academic possesses belief in tolerance in human relations, how does he reconcile his presence in, and contributions to, a society that is constitutionally and operationally organized on the premise that some 80 percent of its citizens are inferior? "It takes some getting numb to," said an American scientist who has been working in South Africa for several years.

For those who remain sensitive, there is, of course, the opportunity—within bounds closely scrutinized by the government—to oppose the system. Such opposition involves no little courage; also no great, if any at all, effect. But it is at least rewarded with a sense of fighting a worthy fight. One student leader said, "Nazi universities are damned for not opposing Hitler. They're not going to be able to say that we didn't put up a fight." He added, however, that he found it to be a hopeless one, and that he was seriously considering leaving the country.

Will the needs of the economy erode *apartheid* simply because of the hunger for trained labor and the spread of education? There are those who say this is already happening. However, if *de facto* slavery can be imposed on gold miners and domestic servants, it is difficult to see why the same cannot be done to computer programmers. With modern police-state methods—and South Africa is not laggard in this field—many things are possible, for racism has bedrock foundations in South Africa, and the problem of making the whites still richer need not inevitably involve an extension of humanity to the blacks. Education and high technology do not necessarily produce generosity.

In this regard, a small incident is perhaps worth relating. I was with a white South African—a decent, well-turned out chap is how they would describe him there; a university graduate occupying a medium-level position in his professional hierarchy. On an extremely sunny day, we passed a tattered-looking black who was wearing sunglasses. My companion said, "Look at that silly bugger. His ancestors were out in the sun for millions of years and *he* has to wear sunglasses."—D. S. GREENBERG

Medical Schools: Portents of National Health Insurance

After World War II, a lot of people believed that health care problems in the United States would be solved if only the medical schools would increase their production of physicians. Today the question of how physicians are utilized looks just as critical as how many physicians there are. And the medical schools are again being nominated to lead us out of the health crisis by taking the initiative in reorganizing the delivery of health services.

The biggest contributor to the shift in assumptions was experience with Medicare and Medicaid, which proved that increasing the effective demand for medical services without substantially increasing resources or reforming the delivery system resulted in drastic rises in costs and strains on service.

However urgent the need for change, the medical school faces real difficulties in filling the role of agent of reform. A few medical schools are tottering on the edge of bankruptcy, and certainly many others are practicing financial brinkmanship. Few medical schools, public or private, are able to afford extensive curriculum reform or the community-service projects and experiments with the health care delivery system which must precede serious reform of the health care system.

Facing deeper deficits than ever, the medical schools, in some desperation, are looking to the federal government—whence came their help in building biomedical research after World War II.

Despite widespread recognition of a health crisis, there is no real sign that help is on the way. Neither the Administration nor Congress, or for that matter the medical profession or the increasingly potent groups representing the users of medical services, have a clear idea of a practical design for a reformed health care system or how to achieve one.

What is happening, nevertheless, is that pressure is mounting rapidly for creation of a National Health Insurance (NHI) program, which would expand on Medicare and Medicaid. It can reason-

ably be predicted that the matter will become a major political issue by the next presidential election.

If a broader federally supported health program is established without greater support of medical education and research, the medical schools will be subjected to ever greater demands for service and the production of manpower and will find it even harder to meet these demands.

Two reports released within the past month can fairly be regarded as harbingers of National Health Insurance. The first, released in late June, came from a Task Force on Medicaid and Related Programs, appointed last year by then Secretary of the Department of Health, Education, and Welfare Robert H. Finch. The panel, headed by Walter McNerny, president of the Blue Cross Association, provided a critique of the existing program rather than a design for National Health Insurance, but it did warn that a major expansion of government and private insurance payments for service without a reordering of priorities and an augmentation of resources would result in "a disastrous rise in the cost of services that are already scarce."

The task force does favor group practice, prepaid health plans, and some form of National Health Insurance but offered "no prescription for a new health care delivery system."

Initiated by Reuther

Last week, the Committee for National Health Insurance, a group recruited from among well-known private citizens and founded by the late Walter Reuther (*Science*, 28 November 1969), urged enactment of a universal health insurance program. Financing would follow the federal trust fund pattern, with the money coming from general revenues (40 percent), a tax on employers' payrolls (35 percent), and individual contributions (25 percent). Preventive medicine would be emphasized in the program, and the prepayment principle would be implemented through federal contracts with providers of service such as physicians in group practice.

The committee has put forward no blueprint for a medical care delivery system. Reuther himself was regarded as believing that only putting massive pressure on the system would cause it to change.

For the medical schools, the major policy question raised by the approach of NHI is whether medical education and research in the academic medical center should be supported from service payments or should be financed separately.

The financial difficulties of the typical academic medical center arise in part from the kind of medicine practiced there and the payment policies of federal programs and private insurers. Medical centers attract a great majority of patients suffering from acute disease or undergoing complex surgery. This kind of service requires a large staff of highly specialized physicians and nurses, as well as a big supporting cast of ancillary health personnel. Such patients depend on the full resources of a medical center—including its education and research resources—but in practice it is impossible to prorate the costs of medical education, research, and service, and so patients' bills, in this sense, never reflect full costs.

The provisions of Medicare and Medicaid were strongly influenced by physicians in private practice through the American Medical Association, and it appears that payment provisions come much closer to paying full costs of care in community hospitals, where patients tend to receive less sophisticated treatment and stay for shorter terms.

Medical education historically has been partly subsidized through payments for service, but several factors, primarily the increase in the costs in teaching hospitals, have put the squeeze on this subsidy. The bias against federal support of medical education, bolstered through the years by organized medicine, has been breached but still remains consequential. Grants for construction of educational facilities for training health professionals were first authorized in 1963, and in 1966 the first institutional grants were appropriated. Federal money for medical education is still concentrated in two programs, a "basic" improvement grant program and a "special" improvement grant program. Both are designed to reinforce expansion of medical school class size, but the basic program is essentially a formula grant program in which all medical schools share. The special grant program, first funded in fiscal 1968, is biased in favor of schools which are in financial trouble or which are making serious efforts at curriculum innovation.

By last year, funding for each program amounted to about $20 million, but even the total $40 odd million spreads pretty thinly among more than 100 medical schools, particularly since the program has come to be regarded as a rescue fund for schools in extremis.

The financial troubles of the medical schools have been compounded by the practice of piggybacking medical education on federal research-project funds. The partial payment of faculty salaries with funds from federal research grants has been a common medical school practice. That practice, which really financed the growth of medical schools in the past 2 decades, is now beginning to boomerang, as research funds are cut and a kind of reverse multiplier effect begins to work. The crisis in health care can be looked upon as a crisis in financing. The Social Security approach to the problem has been to provide money to pay the medical bills of specific groups of people and to ignore the health care system and the effects of major federal programs on that system. Medical education has been subsidized by service and research, so that medical education is financially the weakest spot in the system.

Help For Education and Research

There is little hope that the medical care system will be successfully reformed or even shored up unless ways are found to recognize the importance of medical education and research to the system and to support them adequately. But just as observers agree that improved cost and quality controls will have to be built into a reformed health care delivery system, so medical education and research will also be scrutinized for performance and productivity. Medical schools will probably have to explain, for example, why, although they have managed a respectable increase in the size of entering classes, they have been increasing the size of faculty at a much greater rate.

National Health Insurance looks like an idea whose time is coming soon. It will be unfortunate, perhaps disastrous, if NHI follows the path of least political resistance, as did Medicare and Medicaid. The case histories of the two programs should convince those in charge to get the diagnosis right before they up the medication.—JOHN WALSH

Erratum: In "Layered basic complex in oceanic crust, Romanche Fracture, equatorial Atlantic Ocean" by W. G. Melson and G. Thompson (p. 817, 15 May), the third centered head in Table 2 should read "C.I.P.W. normative composition (percent by weight)."

Erratum: In Table 1 of "Transplantation: Pairing of donor and recipient" by F. H. Bach (p. 1170, 5 June), sibling No. 1 should be positive (+) for antigen 10 rather than negative (—).

Erratum: In "Cones of living amphibian eye: Selective staining" by A. M. Laties and P. A. Liebman (p. 1475, 19 June), Figs. 1 and 2 are reversed. Figure 1 is incorrectly at the bottom and Fig. 2 at the top.