

sumption of DNA as the primary genetic material, and indeed many of the ideas developed in the last three months do fit existing theories.

When Dr. Temin presented preliminary evidence that this postulated enzyme did in fact exist and that RNA was being used as a template for DNA, his announcement was like a bugle call to his colleagues. Dr. Green and his colleagues in St. Louis, Dr. David Baltimore at the Massachusetts Institute of Technology and Dr. Sol Spiegelman of Columbia University are among those who have demonstrated Teminism. They report the presence of an enzyme, RNA-dependent DNA polymerase, which participates in the synthesis of a strand of DNA from the RNA template. There follows a series of events in which an RNA-DNA hybrid is formed, and then a DNA-DNA duplex which can be inserted into the natural DNA of the host.

Not one but three specific enzymes are involved in this process, according to Dr. Spiegelman, "All three," he says, "are vital to the final conversion of a normal cell to a cancerous one." In studies thus far, only those RNA viruses known to cause tumors have been found to possess these enzymes, though Dr. Spiegelman speculates that other RNA viruses, closely related to tumor viruses but not themselves carcinogenic, may contain them.

In any case, the unproved presumption of the moment is that none of these enzymes function in normal cells. Therefore, in theory, it may be possible to devise drugs which will selectively block the cancer-causing process without damaging cells. Already, the Columbia University group is pursuing this idea with actinomycin-D, itself too potent for human use but experimentally useful, and with certain of the rifampicins (SN: 1/17, p. 70) a relatively recently studied class of antibacterial-antiviral agents.

While therapeutic prospects are being tentatively explored, scientists are also using the fruits of this research to search for RNA viral information in human tumors. Here two routes are open. First, known tumor-causing viruses can be induced to synthesize DNA in the laboratory and then, in culture, this can be exposed to bits of human tissue to determine whether any DNA-RNA hybrids are formed, indicating the presence of complementary RNA in the tumor. Second, investigators can assay human tumor tissue for presence of RNA-dependent DNA polymerase, easily identifiable by laboratory methods. With both these approaches in mind, mass screening programs are contemplated. Dr. Todaro, who recently identified the first virus to be found in human breast tissue (SN: 6/27, p. 611), is eager to put it to this test to determine if it really is a cancer-causer. □

BLUE-COLLAR WORKERS

In group of the '70's



UAW

Blue-collar workers: Progress has been substantial, prejudice is low.

The strength of the Wallace vote in the 1968 Presidential campaign has focused considerable political attention on the blue-collar worker. The Democrats have been shaken by the voting disaffection, and the Republicans are teased by a potential new voting bloc.

The perturbation in the political process is bringing subsequent changes in Government and social science research interest. Jerome Rosow, the Assistant Secretary for Policy, Evaluation and Research in the Department of Labor, in April issued a memorandum titled "The Problem of the Blue-Collar Worker." Rosow focused on the purported economic strains of blue-collar families and the social problems that white blue-collar workers were facing from nonwhites in areas of housing, education and jobs.

The Ford Foundation has helped spur research in the area with a grant to the Center for Manpower Policy Studies at George Washington University in Washington, D.C. The center's studies on blue-collar workers are now being completed. The preliminary results indicate that although blue-collar workers may be expressing economic stress due to general economic conditions, their rise in earnings in the past decade has been about the same as other major occupational groups'. Other parts of the study suggest that race relations among blue-collar workers, at least outside of the South, are better than had been believed.

A major concern of representatives of blue-collar interests has been that blue-collar earnings are not advancing as much as other occupational groups'. Dr. George Miller of the Census Bureau compared median earnings of various occupation groups between 1959 and 1968 and found that white blue-

collar earnings rose from \$5,877 to \$7,452, an increase of 27 percent during the decade. White professional and managerial workers earnings rose from \$8,246 to \$10,175, a 23 percent increase. Black blue-collar workers rose in income from \$4,003 to \$5,756, a 44 percent increase. "In spite of talk of blue-collar workers falling behind in earnings, they have kept up. All occupational groups have moved up the same," says Dr. Miller. The blue-collar workers, however, would point out that in actual dollar gains, they have not kept pace.

In investigating blue-collar attitudes toward blacks, Dr. Richard Hamilton of McGill University in Montreal queried white populations regarding the rights of blacks. He finds that in non-South regions of the country, there are no differences in response between blue-collar and white-collar workers. In general, the attitudes are positive. However, Dr. Hamilton reports that in the South blue-collar workers are less tolerant than white-collar workers. "Working class authoritarianism is only to be found in the South," he says. "The level of tolerance in the American population is a lot more advanced than most people think. The silent majority is extremely tolerant." Dr. Hamilton attributes the tolerance in part to the presence of blacks on television as well as increased personal contact between blacks and whites in shopping centers and neighborhoods.

Dr. Jules Cohn, a management consultant, finds similar results after assessing orientation programs in some 250 companies nationwide. He interviewed more than 600 foremen and workers and finds that blue-collar workers are generally more curious and apprehensive than antagonistic toward new em-

ployes who are "disadvantaged."

Dr. Cohn reports that some workers were upset with privileges that blacks initially received, but there were also some other less anticipated results. "White blue-collar workers have learned from blacks to be freer and more assertive toward management in bargaining. Blacks are less intimidated," he contends.

Dr. Sar Levitan, who organized the symposium of research studies, believes that the lower-middle class will be the "in" group of the seventies. "In the sixties, social scientists and governmental programs showered attention on the poor, but the problems of blue-collar workers are likely to receive top billing in the years ahead," he says. □

PARASITOLOGY

Amoebic killers



Dr. J. L. Griffin

N. gruberi: Invader of the brain.

Although medicine is even older than civilization, new disease discoveries are still being made. A fearsome one has been recognized in recent years, produced by a one-cell organism that now and then gives up its free-living state to become a parasite of man. Mercifully, human invasion is rare, for the invader, an amoeba, destroys the brain tissue and produces death in from four to seven days. Only 50 cases are known.

The largest outbreak of the amoeba-born disease occurred in a swimming pool in Czechoslovakia. Thousands of persons used the pool. Some 17 contracted encephalitis. Autopsy examination of their brains showed that amoebas had deeply penetrated the cortex of the brain, clustering around blood capillaries. The abundant oxygen in the brain's blood supply may be why this new-found invader chooses brain tissue. As a free-living organism it requires oxygen, unlike most of the parasites who live with man.

These amoebic invaders enter the nose of swimmers and eat their way

through the olfactory tract to reach the brain. Their victim usually feels he has a bad cold. The amoebas move faster than body defenses can be mobilized against them, according to Dr. Joe L. Griffin of the Walter Reed Armed Forces Institute of Pathology, who has watched them outpace blood cells in tissue culture. By the time moving amoebas can be detected in samples of cerebrospinal fluid, the invaders have reached the brain, the patient is unconscious and chemotherapy is useless.

Two of three brothers who picked up the amoeba playing in a pond of an English garden were, however, saved. When one of the boys died, physicians found the organism in his brain and quickly gave an antibiotic, amphotericin B, to the others. Dr. S. R. Das of the Central Drug Research Institute of India had shown that the drug checks the disease in mice.

This free-living amoeba, *Naegleria gruberi*, is not confined to tropical countries lacking modern sewage disposal. Four deaths traced to *Naegleria* occurred in 1967-69 in Virginia. Dr. Charles Richards of the National Institute of Allergy and Infectious Diseases, Bethesda, Md., has found *Naegleria* in domestic fresh-water snails. Cysts, the survival capsules in which amoebas live when separated from a food supply, suggest that snails may be a vector.

The most marked aspect of this disease is its rapid onset in young and healthy persons. When such patients are seen with flu-like states resistant to common antibiotics and when no bacteria can be found in cerebrospinal fluid, physicians should suspect amoebic meningoencephalitis. Dr. Lubor Cervá of the Czechoslovak Army Institute of Hygiene, Epidemiology and Microbiology in Prague advised colleagues at an international congress of parasitology last week in Washington.

The brain-invading amoebas have nothing at all to do with the widespread amoebic dysentery produced by much larger protozoa, *Entamoeba histolytica*. This cell is without the normal apparatus (mitochondria) for using oxygen. It is anaerobic and must live as a parasite. In the human gut, it causes chronic and debilitating disease, sometimes invades the liver and other organs.

Dr. L. S. Diamond of the National Institute of Allergy and Infectious Diseases has perfected a simple skin test useful to detect amoebic dysentery on a mass basis. He did this by developing a bacteria-free culture of *E. histolytica*, from which test antigen is derived. Before his work, parasitologists thought this amoeba must have bacteria to live (it feeds on them in the gut). These contaminants caused non-specific reactions to earlier tests. □

POLITICAL SCIENCE

Relevance and a new candidate

Prof. Carlos Munoz of the Chicano Caucus interrupted his low-keyed, almost inaudible presentation.

"If I can have your attention . . ." he thundered. The 30 or 40 listeners, who had been twittering like starlings, snapped into abrupt silence. "I'm getting tired of all this liberal b——," continued Prof. Munoz.

The audience winced at the word liberal. For the concept of liberalism has an Establishment ring to it, and this was a meeting of the Caucus for a New Political Science. The caucus has little use for the Establishment, either that of the nation, or that of the American Political Science Association.

"In 1967," says Dr. Phillip Brenner of Johns Hopkins University, "the American Political Science Association had its annual meeting at a time when the war in Vietnam was in full rage, with a tremendously unsettling effect on the American polity. Yet the association made no mention of it. This is supposed to be a body of scholars who are studying the American polity, and yet it saw no relationship between the war and what was going on in America."

It was this silence that led to the formation of the caucus. In the years since, its members have had considerable influence on the topics discussed at the annual meetings of the association. Last week in Los Angeles (see page 250) there were numerous panels not only on Vietnam but on caucus interests such as the rights of blacks, women and chicanos, and including topics like "Political Repression in the '70's" and "Radicalism in the Social Sciences."

But if the meeting has loosened up—largely as a result of the caucus's ability to turn the association's business meetings into parliamentary shambles—the leadership of the association, and the pages of the association's professional journal, haven't. The officers of the association are nominated by a small committee; until recently there has been no opposition candidate. And the journal—THE AMERICAN POLITICAL SCIENCE REVIEW—has been firm, says Dr. Brenner, in its refusal to open its pages to research which the caucus deems important.

As for the association leadership, the caucus is optimistic. Last year it sponsored an opposition candidate who gained a third of the votes cast by mail ballot by the members during the year. This year it is supporting a man for president-elect whose prominence makes him a stronger contender: Dr. Hans Morgenthau of the Univ. of Chicago and City University of New York.