covered the role which the vitamin biotin plays in this and many other such carboxylations. The problem was complicated by the fact that biotin does not function as a free molecule but is enzyme-bound. Nevertheless, Lynen found an enzymic system which will cause carbon dioxide to react with free biotin and has identified 1′-*N*-carboxybiotin as the essential intermediate which transfers carbon dioxide from solution to organic compounds such as acetyl coenzyme A. With this work Lynen added "active carbon dioxide" to his discovery of "active acetate" and his contribution to the discovery of "active isoprene."

Bloch has recently turned his attention to the biosynthesis of olefinic fatty acids. His investigations have revealed that these compounds are formed by two different pathways. One of these, present only in aerobic organisms, requires molecular oxygen to effect the desaturation of preformed acids, while the other, utilized by anaerobes, provides for the introduction of the double bond during the condensation process which forms the aliphatic chains. These studies have led Bloch to a consideration of comparative and evolutionary biochemistry, and his thinking in this area has provided a new sense of unity in lipid metabolism.

These synthetic pathways to fatty acids and cholesterol are complex and are interesting in detail largely to the expert. But they are of general scientific interest because their elucidation provides almost a new dimension to the description of living organisms. Admittedly, our knowledge is still fragmentary. But the work of Bloch and of Lynen goes far to justify the claim made in the opening paragraph that a rough scheme for the chemistry of life is visible. To be sure, intermediary metabolism extends far beyond the work of Bloch and Lynen, far beyond steroids and fatty acids. Much brilliant work has been done in tracing the pathways for the formation of purines and pyrimidines, of amino acids and carbohydrates, and of many other important metabolites. The achievements of Konrad Bloch and Feodor Lynen are thus significant not only in and of themselves but because they illuminate by example the spectacular recent developments of intermediary metabolism.

Feodor Lynen was born in Munich on 6 April 1911, the son of Wilhelm L. Lynen, a distinguished professor in the Technische Hochschule. He received his training in chemistry at the University of Munich, where he studied under Heinrich Wieland, himself a Nobel laureate, whose daughter Eva, Lynen married in 1937. Lynen was appointed lecturer at the University of Munich in 1942 and was made professor in 1947. He is, at present, director of the Max-Planck-Institut für Zellchemie at Munich. His laboratory has become a center of training for young American biochemists as well as for Europeans. An enthusiastic mountaineer, Lynen has made an avocation of climbing and shares with Bloch a love of skiing. He is the father of five children.

Konrad Bloch was born in Neisse, Germany, on 21 January 1912, and attended the Technische Hochschule in Munich from 1930 to 1934. After Hitler came to power in Germany he escaped to America via Switzerland, where he stayed long enough to carry out his first published biochemical researches. He obtained his doctorate with Hans Clarke at Columbia in 1938 and subsequently served as instructor and as research associate with R. Schoenheimer at Columbia's College of Physicians and Surgeons. In 1941 he married Lore Teutsch, whom he had first met many years earlier in Munich, and in 1946 the Blochs went to the University of Chicago, where he was made professor in 1952. In 1954 he was named Higgins Professor of Biochemistry at Harvard University. The father of two children, Konrad Bloch is an enthusiastic skier and tennis player. He retains from childhood days his strong love of music.

E. P. KENNEDY

Harvard Medical School,
Boston, Massachusetts

F. H. WESTHEIMER

Department of Chemistry, Harvard University,
Cambridge, Massachusetts

REPORT FROM EUROPE

Great Britain: Science and Labor's Squeak-in

17 October. Despite advance billing, the need for a more vigorous government stimulation of science played neither a starring nor a featured role in the British election campaign that ended 15 October in the narrowest of victories for Harold Wilson's Labor party and its activist ideas. Ever since Wilson proposed, at the annual party conference in Scarborough in 1963, that Labor take as its new campaign theme the harnessing of science to socialism, many have said that the 1964 British election would be the first political campaign, in a major country, in which science was a central issue. The grouping of British government scientific activities and the effect of scientific policy on Britain's economic future were much argued in the year that led up to the overturn of the Conservative party after 13 years in office. But in the last month of campaigning it seemed that, however vital an explicit policy about science and technology may be to a country's economic future, such complex questions have little to do with a politician's intense last-minute serenading of the wavering voter.

Despite the increasing interest in scientific policy among intellectuals and informed officials, immediate or traditional themes dominated British campaign manifestos and speeches: Should Britain continue to develop an independent nuclear force? What was the quality of the Labor and Conservative Front Benches? What were the prospects for continued prosperity? The Conservatives said the British had never had it so good, and the Laborites said the British will have to fight to improve their lot. It is possible that not even these "gut" issues were paramount, and that the outcome depended on the simple judgments that it was or was not time for a change, or that sharp Harold Wilson or cool Alec Home was the preferable leader.

As everyone knows from the results, the voters divided almost evenly on these questions. The margin of Harold Wilson's majority in Parliament was smaller than the majorities in the elections of 1950, when Clement Attlee's Laborites narrowly retained power, and of 1951, when Winston Churchill's Conservatives narrowly took it. A margin so narrow will place a strain on individual members, who will have to be in constant attendance to insure against the chance of a government defeat. It will restrict Wilson's policy—perhaps including the increased budgets for science, aimed at keeping scientists and engineers from migrating—and will probably lead to an election far sooner than 1969, when the 5-year statutory life of the new Parliament ends.

Wilson's appointments to technical posts added to the surprise.

Richard Crossman had been the Labor party figure who urged Wilson to emphasize science in the campaign. As Labor's Front Bench spokesman on matters concerning science, Crossman had tilted frequently with the Tory secretary for education and science, Quintin Hogg. Yet, when the cabinet appointments were made on 16 October, Crossman seemed to have been shut out of the science post. Last spring Crossman had quarreled sharply with Wilson over policies for elementary education, but apparently he had returned to favor as a campaign headquarters idea man. Although Crossman was given a post in the new cabinet—that of minister of housing and local government—the job of education and science, minus responsibility for the Atomic Energy Authority, went to Michael Stewart, who had been expected to have a role in housing or educational policy but who had not spoken prominently about science.

Frank Cousins, leader of the powerful Transport and General Workers Union, was named head of a new ministry of technology, which will include the Atomic Energy Authority. The appointment of Cousins, who will have to seek entry into Parliament in a by-election, was a surprise. But the Labor party announced long ago that it intended to create the new ministry. Crossman and other Labor leaders had aired several notions concerning the shape of such a ministry, whose purpose would be to find ways of exploiting technology for a faster rate of economic growth. They advanced and then apparently withdrew the idea that the technology ministry would be built around elements of the aircraft-procuring ministry of aviation. The ministry was to include the invention-exploiting National Research Development Corporation, founded in 1949 under Attlee's Labor government and hitherto placed in the Board of Trade (commerce ministry). It would also include the technology side of the Department of Scientific and Industrial Research (DSIR). That department and industry support the work of numerous research associations. Despite the discussion, Labor did not announce details of the ministry Cousins will now head until after the election.

Although Wilson went ahead with the plans for a ministry of technology incorporating the nuclear program, the future of ideas for carving up Hogg's huge ministry is not so clear. On 1 April, Hogg, the former Lord Hailsham, who had been minister for science since 1959, had added education to his already large responsibilities of heading the DSIR and the Atomic Energy Authority. Hogg had been one of those disappointed, after intense campaigning at the 1963 Conservative party conference, by the surprise elevation of Sir Alec Douglas-Home to succeed Harold Macmillan. Hogg was given more scope in the new Home cabinet; he assumed the duties of Sir Edward Boyle, the minister of education, a progressive younger Tory who gave way gracefully. The move was criticized. There was general agreement that no matter how intelligent Hogg was—and he was regarded as one of the brightest of Conservative leaders, despite his sometimes unwisely combative stump speeches—he could not effectively supervise a ministry with so many missions. Nonetheless, Stewart has taken over many of Hogg's responsibilities, if only for a brief period while the cabinet makes up its mind on possible establishment of a ministry of higher education and research. Meanwhile, the role to be played by such scientific advisors as Lord Bowden, principal of the Manchester College of Science and Technology, and P. M. S. Blackett is unclear.

Although technical issues were muted in the last days of electioneering, they probably loomed larger in public discourse in Britain in 1964 than they ever have in the United States. The stress was laid not so much on the intellectual and managerial climate for scientists and engineers as on the need for spurring research to spur the economy.

In late 1963, one of many committees appointed by the Conservative government to consider the future handling of complex problems urged a regrouping of government scientific activities. Despite much unfavorable comment, Hogg announced during the summer that, if reelected, the Conservatives would adopt the suggestion of this committee (headed by Sir Burke Trend) that the Department of Scientific and Industrial Research be dissolved and replaced by a science research council, a natural environment research council, and an industrial research and development authority that would collaborate with the National Research Development Corporation.

Besides the debate on scientific organization that arose after publication of the Trend report, there was discussion of the cost of the nuclear power station program, of development of a new supersonic low-flying bomber to carry nuclear weapons, of migration of scientists to America, and of lack of a parliamentary committee to handle science policy. Most importantly, Wilson and Crossman outlined their philosophy of spurring technical advance and bringing experts of many kinds, including scientists, into the government.

Wilson put it this way at Scarborough: "If there had never been a case for socialism before, automation would have created it. Because only if technological progress becomes part of our national planning can that progress be directed to national ends. So the choice is . . . between the blind imposition of technical advance, with all that it means in terms of unemployment, and the conscious, planned, purposive use of scientific progress to provide undreamed-of living standards and the possibility of leisure ultimately on an unbelievable scale."

Wilson said his program for science could be summarized this way: "First, we must produce more scientists. Secondly, having produced them, we must be a great deal more successful in keeping them in this country. Thirdly, having trained them and kept them here, we must make more intelligent use of them when they are trained than we do with those we have got. Fourthly, we must organize British industry so that it applies the results of scientific research more purposively to our national production effort."

Crossman outlined his views in the British scientific monthly *Discovery* (November 1963). He said that about $85 million a year would take care of most of the problems that were causing basic scientists to leave the country. New universities, he said, should not be small institutions in little cathedral towns (a reference to those now being established) but large ones in large cities, open to teachers from the business world. In such universities, new chairs in new fields should be easier to establish, artificial distinctions between applied and basic research or between arts and sciences should be allowed to disappear, and the cult of the useless in scholarship should be banished.

Discussing defense research establishments, Crossman said some of them "are among the finest in the world," but Britain could not "afford to have so much of our scientific resources huddled into these places if we're not using them fruitfully. . . . One of the reasons we want to get rid of the independent nuclear deterrent is to remove the security label. . . . I would hope to declassify not only a large number of documents but also large parts of these institutions and open them for civil uses."

The idea of introducing scientific advisers into government, Crossman said, was not so much a gimmick for boosting the economic growth rate as a means of forcing the government to face technical questions in a period of "permanent emergency" resulting from technical change.

"The deepest thing which is wrong with this country is a strain of amateurism and of oligarchy. We are a country which has gentlemen who believe that you don't have to know anything special, anything particular; that you don't have to have technological skill; that a good education in a pure language will equip you to take great decisions. This tradition is the greatest single brake on modernizing this country, whether you meet it in Whitehall, the House of Commons, the cabinet, the board of a company, or, above all, in the university."

With this philosophy behind them, ministers Michael Stewart and Frank Cousins now face the difficult job of using more money and initiative to stimulate civilian economic growth. Although Crossman believes that the government's position as a large purchaser will be significant in this effort, he also spoke of large special development contracts. In view of the difficulties already experienced in developing airliners such as the Comet, or British-designed power reactors fueled with cheap uranium-235, competitive with American reactors, attractive subjects for such development contracts may be hard to find. These technical difficulties are widely discussed in Britain, a nation much given to carping. There is a feeling that it is tough to play at the technical-development table dominated by Americans and Russians. But the new Labor government evidently is gearing up to try.—VICTOR K. MCELHENY

Money for Science: NAS Studies Likely To Have Large Influence on Future of Government Support

Starting next month, the National Academy of Sciences will issue the first in a series of reports that are likely to have considerable influence on the future of federal support for the various scientific disciplines. Science and government studies, it is true, often come and go these days without affecting anything but Washington's leading export industry, scrap paper processing. But the forthcoming Academy reports will probably have a long-lasting effect, and the scientific community would be well advised to regard them as highly significant.

The studies, which have been under way for the past year, were organized by the Academy's Committee on Science and Public Policy to develop realistic appraisals, rather than lobbyist pleadings, on the scientific opportunities and financial needs in major fields of research.

For this purpose the committee, chaired by George B. Kistiakowsky of Harvard, set up subcommittees of approximately ten members each as follows: physics, chaired by George E. Pake, of Washington University; chemistry, Frank H. Westheimer, Harvard; astronomy, Albert E. Whitford, Lick Observatory, Mt. Hamilton, California; plant sciences, Kenneth V. Thiman, Harvard; and computer technology, J. Barkley Rosser, University of Wisconsin. In addition, it is also planned to establish a study on molecular biology. The first report, on astronomy, was completed this week and is scheduled for publication in mid-November.

The goal of appraising, rather than lobbying, is a difficult one to maintain, especially at a time when financial pressures are causing some scientists to conclude that unwarranted affluence has overtaken other fields to the detriment of their own. But the Academy has been running the studies with a fairly tight rein, and, as far as such things are possible, the subcommittees have been restricted to analyzing the present state of their respective fields, the opportunities that lie ahead, and the financial support that would be required to realize those opportunities.

The decision to undertake the studies appears to derive principally from the leveling off of federal support for science during the past two years. As the money has grown tighter, concern has developed that political judgments and connections might come to outweigh scientific judgments in the allocation of federal funds. And it was felt that, before the struggling became too intense, it would be extremely useful to have each discipline set forth what can be reasonably anticipated from it in coming years.

Actually, there has so far been relatively little interdisciplinary combat over federal funds, but few things seem to distress the leadership of the scientific community as much as a public row among scientists, and it is fears of just such a row that contributed to the decision to undertake the Academy studies.

A little over a year ago, William D. Carey, executive director of the Bureau of the Budget, made a prophecy about how the scientific community might react to financial distress: "When dollars for Big Science become scarcer," he told the 17th National Conference on the Administration of Research, "the scientific community can be expected to break ranks and form clusters of opinion and dissent . . . . [We] can expect the fur to fly and the issues to be illuminated with far more pungency than we have seen thus far."

It may be that financial conditions are not yet suitable for producing the spectator sport foreseen by Carey, but over the past year, as money has become tight, if not scarce, the evidence has been mixed on whether his prophecy is en route to being fulfilled. There are scientists casting covetous looks at other disciplines, institutions, or regions, and some of them have been making the rounds in Washington to