MAX PLANCK SOCIETY

Backbone of German science

After 20 years, German science, guided by the prestigious Max Planck Society, is regaining prominence lost during the Nazi years

by Ted Shoemaker
(SCIENCE NEWS Correspondent in Germany)

Germany was once the scientific giant of the world, but in the last three decades the great scientific tradition that marked her course through the early part of the nineteenth century has lagged. Germans are asked again and again what has gone wrong. Where are the Einsteins, Plancks, Roentgens, Hahns and Kochs?

The downfall of German science, they answer, came very suddenly—in 1933. The Nazi's anti-Semitic policies forced some 2,000 scientists to flee, fully a third of the nation's scientific brainpower. Severe curtailment of academic freedom meant that there were only half as many university students in 1938 as there had been a decade earlier.

Of the 48 Nobel Prizes Germans have brought home, 31 were won prior to the Nazi ascent to power and many of the remaining 17 were earned for achievements made before 1933. And then came World War II, bringing with it destruction of facilities, economic chaos and occupation policies that barred German research in important fields.

But after the war, German scientists began slowly to put the pieces back together again. Guided largely by the Max Planck Society, Germany is regaining prominence—particularly in biochemistry. "The results of modern biology will probably shift the focus of fundamental research from the field of atomic physics to the field of biology in the very near future," predicts Dr. Adolf Butenandt, the society's president, himself a noted biochemist. Biochemist Otto Warburg, whose discoveries in the metabolism of tumors earned him a Nobel Prize in 1931, says, "Derogatory statements about the decline of German science certainly do not apply to German biochemistry." If they once did, in any case, they apply no longer.

The Max Planck Society for the Promotion of Science, primary source of money and intellectual energy that is channeling Germany's scientific talent to the task of rebirth, sprang from the old Kaiser Wilhelm Society that Max Planck headed from 1930 to 1937. It was renamed in 1947, both to honor the physicist who fathered the quantum theory and to rid itself of the stigma of Wilhelm's name.

The society's philosophical origins date to 1810 when educator Karl Wilhelm von Humboldt called for institutes where scientists could pursue pure research unfettered by teaching chores. Now the society has 52 institutes, about 1,700 researchers and a budget of $73 million (for 1967) of which $55 million came from the Government of West Germany and from the treasuries of individual states. But it follows its path virtually unhampered by Government control. When Planck gave up the Wilhelm Society presidency in 1937, it was in protest against Nazi meddling; that spirit of independence persists. The society maintains a certain political freedom and its own senate has full voice in determining how its resources should be spent, even though political and public views exert a subtle influence.

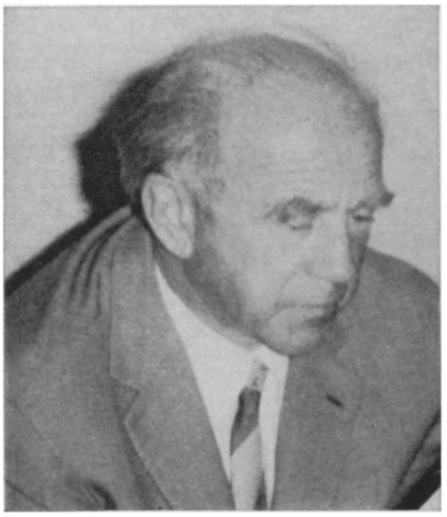
From its start, the society has aimed to operate in fields where the universities do not. Sometimes a science is so new, as was the case with plasma physics and molecular biology, that it has not been made a part of the university programs. Other times the work requires equipment so expensive or specialized that its acquisition would unbalance a university budget.

Butenandt: Shift to biology.

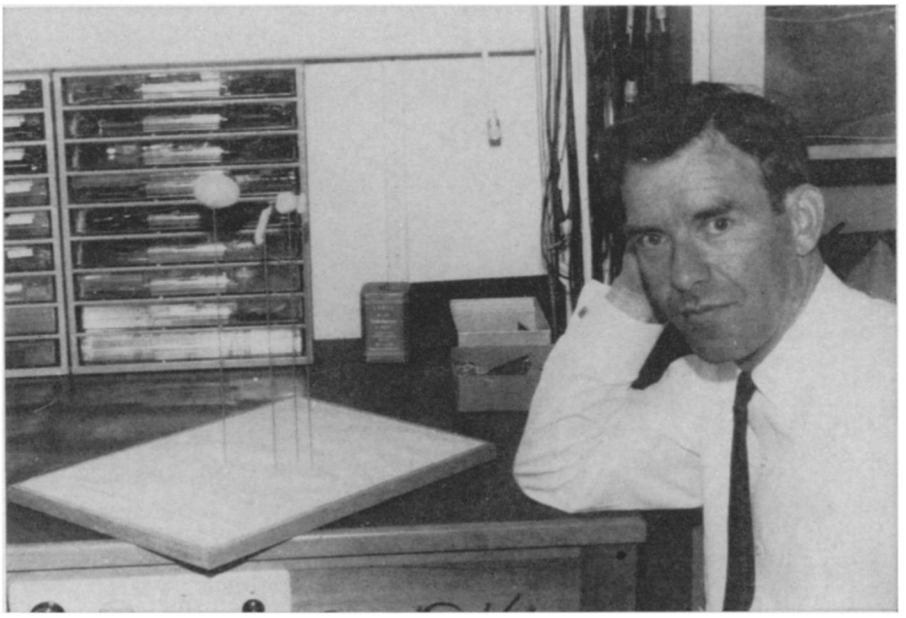
The institutes are established according to the wishes of the men who head them and who assemble co-workers to pursue problems of special interest in their fields. As often as possible the head is a Nobel laureate. Dr. Butenandt won the laurels in 1939 for work with sex hormones. He heads the Institute for Biochemistry in Munich. In Berlin, Dr. Warburg directs the Institute for Cell Physiology. Dr. Manfred Eigen, a 1967 winner for finding ways to measure millionth-of-a-second chemical reactions, leads the Institute for Physical Chemistry at Goettingen and Dr. Feodor Lynen, whose work in the biosynthesis of fatty acids won him the honor in 1964, runs the Institute for Cell Chemistry in Munich.

There are also institutes for molec-

The society efforts range from what will be the world's largest fully steerable radio telescope (model at left) to studies of life forms in a German stream.



Heisenberg: Steps back to space.



Lust: Extraterrestrial physics and rockets in the twilight sky.

ular genetics, medicine, experimental medicine, protein and leather, biology, immunobiology and biological cybernetics. Some of these institutes have subdivisions so autonomous as to be separate institutes in everything but name.

Undoubtedly, the biochemical institutes do overlapping work, and their individual titles are more a matter of semantics than scientific distinction. But this illustrates an important point. "The society is not obliged to insure completeness," says Dr. Butenandt. "It can make special allowance for personality, and the specific interest and abilities of the individual scientist." In other words, the work of an institute is geared to the director, not the reverse.

Even the society senate seldom meddles in the affairs of an individual institute. The director decides, within certain guidelines, what research is to be undertaken. He needs only to file an annual report. The moment of truth for an institute comes when the director dies, retires or resigns. The society then makes a point of asking several questions. Is there a qualified successor? Has the field been accepted by the universities? Have the results of the research justified their cost?

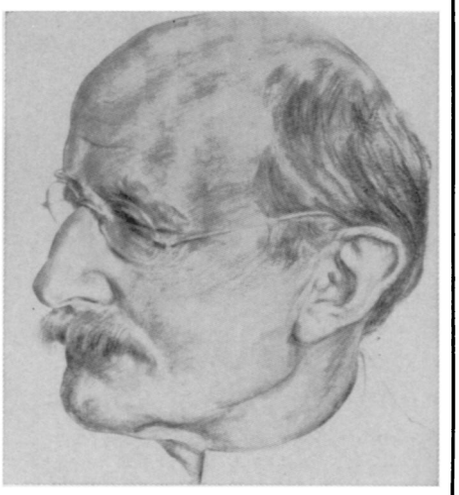
According to the answers, the society either orders the institute to change its course, or withdraws it support. Today's 52 institutes are left from an original 83. Of the 31 that have lost support, many were turned over to a university or Government agency; some have been dissolved.

Some people have attacked the policy of reviewing an institute's work only when the leadership changes. They speculate that this assures an aged, conservative direction. No doubt it does to some extent, but officials say this is a price that must be paid for political independence.

Besides, they say, the society's leading lights are not all old by any means. Young men frequently succeed to directorships. Dr. Eigen, now 41, was 39 when he took over his institute. Even president Butenandt, now 65, was only 33 when he took over the Institute for Biochemistry. Vice president Werner Karl Heisenberg, now 68, is a founder of quantum mechanics and won a Nobel Prize when he was 31.

But the biological sciences are not the society's only business. Through it, Germany is moving back into astronomy, where she has been stagnant for decades. The society had no institutes in the field until two years ago, but now has established two. The Institute for Radioastronomy is building the world's largest fully steerable radio telescope near Bonn. The Institute for Astron-

. . . German science



Planck: Independence was a must.

omy will build two large observatories, one in the Mediterranean area and one to view the southern sky, probably in South Africa.

And now the homeland of rocket pioneer Wernher Von Braun also is taking a few small steps in the direction of space research. The Institute for Physics and Astrophysics near Munich, headed by Dr. Heisenberg, is, among other things, the main agency for Germany's contribution to the research programs of the European Society for Space Research.

Dr. Reimar Lust, 46-year-old head of an autonomous institute under Heisenberg, has captured the German public's imagination as has no other scientist in recent years. His Institute for Extraterrestrial Physics shoots rockets into the twilight sky, where they release clouds of barium gas at an altitude of 120 miles. The solar wind ionizes the gas, causing it to glow with an auroral beauty and to form itself along the earth's lines of magnetic force. This permits optical studies of the earth's magnetic field. Dr. Lust releases such rockets from widely scattered parts of the earth's surface, to date in the United States, Canada, North Africa, northern Sweden and India.

Manpower takes a special effort. A special department was established at Tuebingen last year, just for the development and training of the society's most talented young scientists. And officials have even gone so far as to compromise Humboldt's ideals a little bit in its quest for young talent: Until recently, society scientists were strictly barred from holding university teaching posts. Now they may hold them, as long as this doesn't unduly interfere with their work. It is freely admitted that this change in policy was mainly to keep in touch with the upcoming generation of scientists. ◇