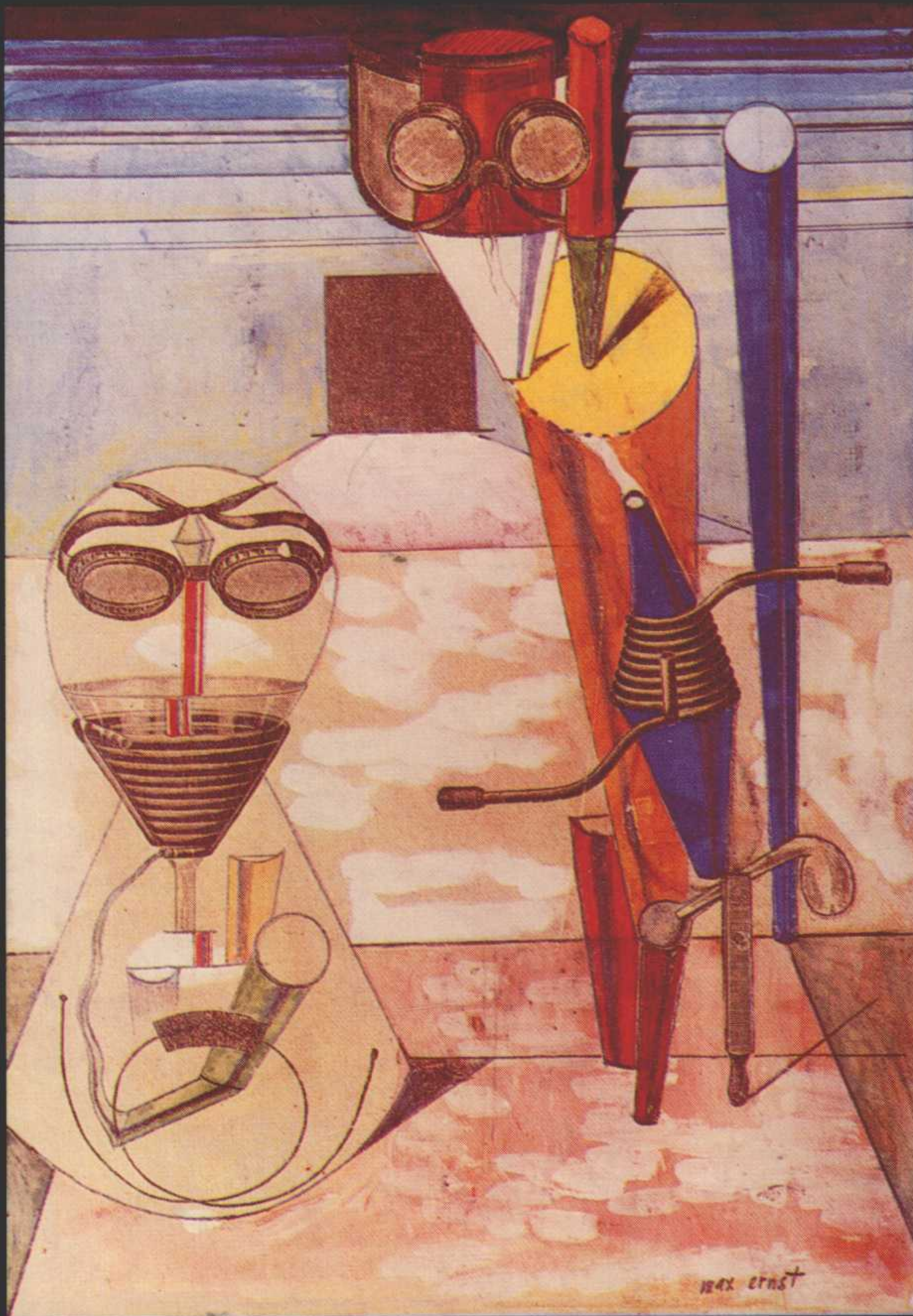


NIGHT THOUGHTS OF A CLASSICAL PHYSICIST

"A brilliant piece
of scholarship and a
profoundly moving
portrait of a man and
his time."

—Peter Stoler, *Time*



RUSSELL
McCORMMACH

"A sensitive and compelling work about the confrontation of a classical spirit with the raw disorders of the modern scientific age."

—Daniel J. Kevles, *New York Times Book Review*

"This is a successful experiment in the writing of history. McCormmach's creation, Professor Victor Jakob, is a sad and aging German theoretical physicist—reminiscent of one of Chekhov's characters—who is facing the imminent defeat of his country in the last months of the Great War, and reflects on the end of the era in which he has lived and worked. The rich detail with which McCormmach presents the daily life of his academic scientist and the ideas such a man might have about the physics and the culture of his time comes from a mastery of the scientific literature together with an extensive study of archival materials not used before by historians. The real details are composed into a moving and effective portrait. It is a book to be read and pondered."

—Martin J. Klein

"An extraordinary experiment in historiography. Its aim is social history: a portrait of German physics in the first decades of this century. But its genre is narrative . . . McCormmach gains access to narrative by framing his portrait as a late chapter in the life of a composite physicist, a man who never existed but who knew and interacted with those who did. Based on impeccable and wide ranging scholarship, his authoritative portrayal has the vitality and directness that only narrative affords."

—Thomas S. Kuhn

"*Night Thoughts* is an interdisciplinary adventure, designed to entice the reluctant general reader into the unfamiliar terrain of physics; to lure the wary specialist out of the laboratory and away from the blackboard, into the world of fantasy . . . [McCormmach's] prose acquires an emotional breadth and intellectual depth seldom achieved by the novelist . . . An innovative and often lyrical book, written with a physicist's precision and a poet's intensity."

—Elaine Kendall, *Los Angeles Times Book Review*

"I should like to recommend it to a large audience . . . for its charm, its intensity, and its scholarship."

—Laurie M. Brown, *Science*

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Russell McCormach

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Designed by Gwen Frankfeldt

His thoughts go this way and that without order, reality and dreams, wishes and events that actually happened, place and time pass his soul in foglike rolling motion; most of the time he does not know where he is, believes himself to be traveling, in America, on the boat . . . It is always as if his soul were far, far away, in a beautiful, noble sphere where only science and eternal laws rule, and then that does not correspond to anything which surrounds him and he becomes unclear and confused.

—Anna von Helmholtz to her sister, 18 July 1894

*In memory of Christa Jungnickel,
Who was my life,
Night Thoughts and Day Thoughts become one*

ILLUSTRATIONS

- opposite Author's drawing after Edvard Munch's oil painting in 1906 of the Jena theoretical physicist Felix Auerbach.
- p. 13 Jakob's gallery of physicists' portraits. In the center is Helmholtz, at the top is Maxwell, and, proceeding clockwise, are Kundt, Hertz, Drude, and Kirchhoff. The portraits are taken from contemporary books.
- p. 37 Adolf von Menzel's oil painting *The Balcony Room* with Jakob's portrait gallery.
- p. 71 Exhibition and practice trenches in Berlin during World War I. Photograph courtesy Bildarchiv preussischer Kulturbesitz.
- p. 115 Memorabilia. Objects that Jakob spread before him on his desk included this photograph of Drude and a letter by him on Alpine Club stationery together with a contemporary print of the new Berlin physics and physiology institutes.
- p. 129 Memorabilia. The September 29 afternoon edition of the *Frankfurter Zeitung* with headline "Enemy Assault on the Western Front" together with food ration cards and photographs of children, soldiers, and Goethe's Frankfurt house, as these objects naturally came together on Jakob's dining table and needlework mat.
- p. 219 Planck at his desk. Photograph by Hans Hubmann from Armin Hermann, *Max Planck in Selbstzeugnissen und Bild-dokumenten* (Reinbek bei Hamburg: Rowohlt, 1973).



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THE TOWN

WOULD IT EVER GET LIGHT, THE OLD PROFESSOR WONDERED. He felt the cold rise up his arms.

Through the chorale the old professor had sat unmoving, and resisting the warm feeling musically uniting the audience. He couldn't rise to the passion of the music. He resented this blend of German patriotism with the current cult of Bach, and anyway he had heard enough of the emotional work of the young Bach. He liked the more lawful forms of the mature Bach, the classical structures built upon fundamental principles. They reminded him of his own physics . . . But not this. Over the monotonously beating organ, voices were laying down a restless, nibbling complaint of sorrow. Then came the final cantata, a timely celebration of victory through heavenly power. The fall of the enemy was prefigured in the song of joyous battle.

A severe headache was bringing the old professor closer to tears than any music would. Fortunately, the planners of tonight's program had recognized that the hearers were the nervous people of the twentieth century and accordingly shortened the musical prelude. He applauded vigorously for a few moments. He didn't look at the audience, but busied himself with the papers in his lap. Someone seemed to have left open a stagedoor to the night air. In his evening dress he was shivering.

He clenched the invitation, which read stiffly: You have the opportunity to be active in a patriotic manner. He knew that the university town was just small enough to make this event an obligation as well as an opportunity. And it was just large enough that he didn't recognize many in the audience apart from members of his circle, the prorektor and senate from the university and the Goethe Society.

PATRIOTIC EVENINGS. HERR PROFESSOR DR. VICTOR JAKOB WILL SPEAK ON HIS EXPERIENCES OF THE YEAR 1870.

But it wasn't his turn yet, as imperial flags with golden fringes were moving toward him down the center aisle. The prorektor bent toward the professor and pointed to an insertion in his invitation. ARTISTIC RENDERINGS OF PATRIOTIC IDEAS. Would the evening never end!

From previous evenings like this one, he remembered a talk on culture and war and another on the blessings of war. He had missed the talk on the moral and physical characteristics of soldiers, but not the one on the significance of the Prussians in this war, which proved most popular. His own talk was different in that it was a philosophical reflection. It was hard for him, since public reticence on

personal matters was the *sine qua non* of his science. It was hard, too, since he had to keep the German destiny before his audience's eyes, which meant in a certain sense identifying himself with it.

A boy's soprano rose: I had a comrade at arms, you will not find a better . . . Belts held in place uniforms that were too large for these children of, what, thirteen or fourteen? They would soon grow into them and wear them in earnest. Standing in a semicircle, they lowered their flags over a boy on the floor. Another boy knelt beside the fallen and held up his rifle in a gesture of victory. The young voice went on solemnly: The drum called us to battle.

Now Professor Jakob read aloud from his carefully composed recollections: I was a junior officer when Germany fought France alone. From that war between two peoples, a united Germany arose. From today's world war, a Germany will arise that we cannot foresee. Still, with the worst possible outcome—loss of wealth, colonies, and provinces—we cannot lose the national feeling that we won on the battlefields of France in 1870 and 1871. Even if the enemies of Germany try to divide what Bismarck joined, they will not succeed in the long run. With our national feeling, Germany will rise to be a world power again.

Those thoughts were well received. Yet he couldn't go on, unable to focus on the words in front of his eyes. So he looked up from the lecture and began to tell a story. He and his platoon had been crawling up a wooded hill looking for a place to shoot from. Shells and grenades were falling all around them, and shrapnel and flint balls were flying just over their heads. Yet he (stupidly!) stood up and walked out of the woods to see the enemy better. It had been then that . . . A sharp pain in the side of his head drove the

image out of his mind. Professor Jakob grasped the lectern and murmured an apology. Perhaps we should now turn to the young for tales of heroism, not to the old.

There was applause, though he scarcely heard it. He sat down with the prorector's discreet support. On that field of slaughter fifty years before, his head had been grazed by a bullet, but that now seemed nothing compared to the explosion of pain in his head a moment ago. One more musical act of communal uplift to endure, and he could go home. The audience sang: Dear Homeland, you can be calm, strong and true stands the watch on the Rhine. He had done his part to sell war bonds.



THE STUDY

HOW DID IT HAPPEN? THE DOCTOR WAS WHISPERING TO Jakob's wife in the doorway to his study. The people who brought him home said he had fainted, and Jakob hadn't troubled to correct them. What really happened was that after the program he had fallen down, and they hadn't noticed until they nearly stepped on him! Let him rest for now, the doctor advised Helene. The professor is still confused (he wasn't), but he'll be fit again. After all, for a man of sixty-nine . . .

The director of the physical institute looked concerned as he bent over Jakob. They had had strained relations in the past, at times communicating only by written messages delivered by the porter. But their relations had mellowed, and now the director badly needed his associate's services. Who, after all, was there to replace the institute's theoretical physicist in these short-handed times?

Despite Jakob's condition, the director insisted on amiable conversation. As he saw it, the war should leave Germany dominant on the continent. Didn't it now dominate the Ukraine, the Crimea, the Baltic provinces, Poland, Rumania, and Finland? With the breakup of Russia, didn't Germany control Eurasia from the Oder and Vistula to Vladivostok? With Ukrainian grain to feed the German people, Rumanian oil and iron from Lorraine to feed German industry, and a colonial empire in Central Africa, wasn't Germany a world power equal to Britain and America? Wasn't that the point? Of course, to reach their highest development, Germans must not spare themselves nor their leader spare them. Leaning close to his silent associate, the director asked: Would Germany's position assure the future of the monarchy and empire?

The old professor raised himself on an elbow to reply: The facts! Isn't the Geheimrath overlooking the facts? Don't we live in daily fear of a catastrophic breakthrough in the West now that America is sending unlimited divisions against us, Bulgaria is out of the war, Austria-Hungary is on the verge of collapse? Doesn't chaos threaten here at home? Hundreds of thousands of workers in Berlin have struck for food, peace without annexations, and democracy; the cities are starving; soldiers are deserting; the Emperor is defiled, and the monarchy is viewed as an obstacle to peace; the Crown Prince is a profligate, and his brothers are scarcely better. The Geheimrath misses the point. The future of Germany doesn't depend on influence in Turkey or a piece of Belgium. It depends on character, on spirit, on idealism—on, among other things, science!

He looked up at the Geheimrath to emphasize this last point and found himself looking at an empty chair. He is still very weak, he heard his wife say in the vestibule. He

has difficulty focusing on conversation for any length of time. Jakob realized that the Geheimrath hadn't heard a word. But perhaps he hadn't said anything.

The more he thought about it, the more the old professor became convinced that his weakness had been brought on by preoccupation with the war. He went to bed with the war, got up with it, was kept awake half the night by it. He tried to penetrate to what was essential in these times, which made it all but impossible to carry on with his work.

The latest distraction that set the faculty to quarreling was the prorector's attempts to get them to agree on the wording of a statement of their unified will to work for the honor and freedom of Germany, which he would then cable to the Reich Chancellor and the General Field Marshal. In this fifth year of the war, the fiftieth month, no one had any fresh ideas any more, and the old ones couldn't be discussed with any hope of reconciliation.

Droning on about U-boats and about how they had taught people the meaning of technical progress, the director of the physical institute had started the row at the prorector's latest meeting. It was just hours before Jakob had become ill. He could still hear the shouting.

I can't believe that anyone still puts his trust in U-boats, someone had cut short the Geheimrath. Militarily, they have been disastrous, bringing America into the war, and, humanely speaking, they are the worst violation yet of civilized restraint. To sink ships on sight without warning and without means for saving survivors is worse than bombing undefended towns or using poison gas and exploding bullets.

Other members of the faculty tried to make themselves heard then. The prorector even thought it was a good time to get to the business at hand, but he didn't know the

director of the physical institute as well as Jakob did. The Geheimrath shouted on cue that U-boats are humane, since they bring the end of the war closer, especially if the U-boat war is waged with all possible force. Besides, U-boats are going to make wars impossible in the future. They have already caused such panic that navies have all but disappeared from the seas.

So it had gone. Jakob turned to his wife who, he believed, had brought her needlework to his study to be near him: The madness of it, to believe that the world will be at peace when the technology of warfare is complete. She raised a finger to her lips. They were not alone. From the alcove he heard fragments of conversation—the cultural man . . . the man of force . . . failure of nerve . . . Moloch of democracy . . . revolution . . . Bolshevization . . . Americanization. That decided him to lapse into simulated half-consciousness.

After Helene had shown the visitors out, she returned to the study to find Jakob waiting for her, alert and with an apology for saddling her with the burden of entertaining colleagues. They repeat these slogans interminably, he said, but they won't analyze them. There's no talking to them!

Helene explained: They're younger than we are. She continued, seriously this time: Perhaps they're excited by the material and superficial aspects of the war. You're always telling me how busy the war keeps the Geheimrath, how important he has become, or thinks he has. How important *physics* has become! he corrected her. The Geheimrath has not suffered because of the war as Planck and some of your other colleagues have, and so he hasn't had to depend on his physics as they do. She said this as a question.