

## Physicists at the University of Göttingen, 1945–1955

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With a focus on the issue of continuity *versus* change, we present an overview for the immediate postwar years of many aspects of academic physics in one local context. Based on new archival findings, we discuss academic staffing, research topics, course offerings, student statistics, and two complementary biographical case studies of physicists at this former international center for experimental and theoretical physics.

*Key words:* University of Göttingen; physics education; denazification; Germany under Allied control; Kurt Hohenemser; Max Schuler.

### Introduction

The momentous events of the recent past also compel the University of Göttingen to make a fundamental change in course from that of the past twelve years.<sup>1</sup>

Thus opens the draft of an official statement by the University Council (*Senat*) at Göttingen dated April 27, 1945. It was authored by the physical chemist Arnold Eucken, then Dean of the Faculty of Mathematics and Natural Sciences. Six weeks later, when the new Rector of the Georgia Augusta University of Göttingen, Rudolf Smend, proposed “a statement on the ethical and political problems of the times, especially in view of the concentration-camp atrocities and the related propaganda,” the temperature rose again in the University boardroom. The *Senat* minutes of June 6, 1945, record: “Eucken warns against drifting off into the war-guilt issue. Weber underscores the necessity of a basic rethinking. The discussion is broken off.”<sup>2</sup>

Such proceedings raise questions about the mentality, interests, and actions of those who guided science policy after the collapse of the Third Reich, both in general in the Federal Republic of Germany, and in the mundane local affairs of a university department. We do not intend to get caught up in a detailed analysis of individual cases, but rather will attempt to present a bird’s-eye view of the results of more in-depth case studies. We will place special attention on continuity *versus* change and cover academic staffing at the University of Göttingen, research topics, course offerings, student statistics, and two intertwined biographical case studies. The relationship to the Max Planck Institute of Physics, located in Göttingen

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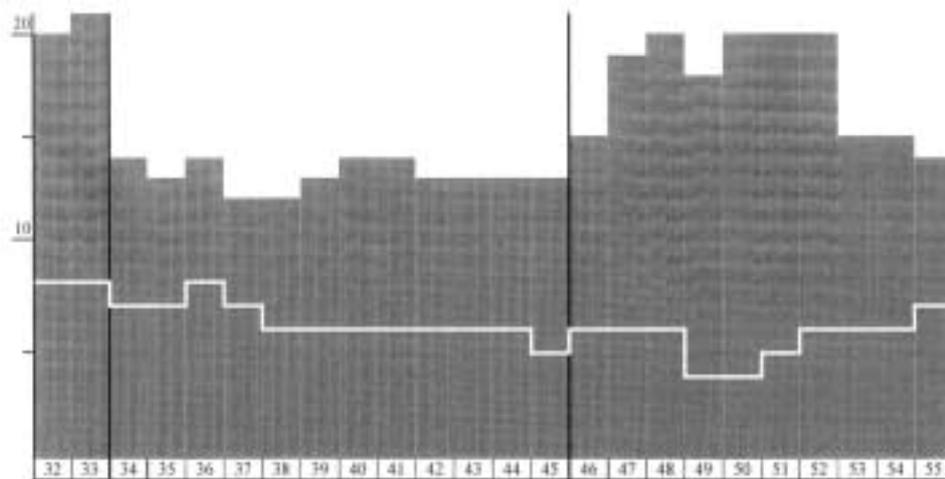
between 1946 and 1958, as well as the Aerodynamic Design Testing Station (*Aerodynamische Versuchs-Anstalt*), will be mentioned only in passing.<sup>3</sup>

### The Teaching Staff and Denazification at the Institutes of Physics

The serious personnel crisis that befell Göttingen in 1933 is documented in a well-researched book on its history during the Third Reich.<sup>4</sup> This book, which first appeared in 1987, became a model of its kind for others, such as histories of the Universities of Hamburg and Braunschweig. The documentation is much worse for the period after 1945.<sup>5</sup> At Göttingen, there is a striking difference between the opening and closing years of the Nazi regime: 1933 marks a drastic break with the past, whereas 1945 is remarkable for its nearly unbroken continuity in the teaching staff if one disregards normal career changes caused by appointments and retirements (figure 1).

In the decade before 1933, Göttingen figured as one of the centers for modern physics; that was the golden age of Göttingen physics. One reason for its prominence was the University's success in acquiring leading physicists in the early 1920s for its theoretical physics institute and for each of its two experimental physics institutes.

The Institute for Theoretical Physics was directed by one of the founders of quantum mechanics, Max Born (1882–1970). The First Institute for Experimental Physics (in the following simply called First Physics Institute) was headed by Robert Wichard Pohl (1884–1976), whose research constituted one of the foundations of solid-state physics; the Second Physics Institute was under the direction of



**Fig. 1.** Histogram showing the size of the teaching staff in the physical institutes of the University of Göttingen between 1932 and 1955. The staff in the experimental and theoretical physics institutes is shown above the white line, that of the applied physics institutes below the white line.

Nobel laureate James Franck (1882–1964), whose name became widely known following the Franck-Hertz experiment on gaseous discharge. The National Socialists' rise to power forced both Born and Franck to emigrate. When Born's assistants soon followed suit, the Institute for Theoretical Physics was crippled. Twenty-eight-year-old Fritz Sauter (1906–1983) stood in as acting director until Richard Becker (1887–1955) was transferred by order of the Reich Ministry of Education from his full professorship at the Technische Hochschule in Berlin-Charlottenburg to take Born's chair in 1936. Even though the institute conducted research commissioned by the German Luftwaffe during the war years, Becker had no difficulty in retaining his post after 1945, because he was not considered to be particularly implicated in the Nazi regime. He had been a member only of subordinate Nazi organizations, not of the National Socialist Workers Party itself. He remained director of the Institute for Theoretical Physics until his death in 1955. So great was his prestige that the University placed an Opel Cabriolet limousine at his disposal in 1951 for official travel purposes.\*

The best symbol of continuity before and after the war years is the director of the First Physics Institute, Robert Wichard Pohl. Pohl had been full professor at Göttingen since 1920 and had oriented his experimental institute wholly toward his own research interests, specifically on color centers in crystals and luminescence. He was renowned for his innovative teaching methods, which were implemented primarily in the introductory lectures. He retired in 1952, passing on his position to his former pupil and assistant, Rudolf Hilsch (1903–1972), who later got a call to Erlangen.<sup>6</sup>

The direction of the Second Physics Institute between 1942 and 1953 was in the hands of Hans Kopfermann (1895–1963), who continued the spectroscopic researches of his forerunner James Franck, developing them for the analysis of hyperfine structure. These investigations provided information on the electric and magnetic fields and substructure of the atomic nucleus; hence, along with their experiments on isotope separation, Kopfermann and his assistants, Wolfgang Paul (1913–1993) and Wilhelm Walcher (born 1910), were able to broaden the focus of the Second Physics Institute to include the rapidly expanding field of nuclear physics.<sup>7</sup>

The arrival of the British and the opening of the denazification proceedings had no effect on these directorships. Any such effect must be sought among the lower academic ranks. Of particular interest are the years following 1947, after the wave of denazification had subsided. Some physicists were exonerated or escaped unscathed. Others who were incriminated underwent what we might call a “migration

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\* Following his assistantship in Hannover, Becker worked temporarily in the explosives industry around 1920 and wrote his habilitation thesis of 1922 on detonation and shock waves. His good contacts in the Luftwaffe were instrumental in his becoming a corresponding member of the *Deutschen Akademie für Luftfahrtforschung* on March 1, 1942, which had been founded by Feldmarschall Göring in 1935–1936. Many of his specialties, which he continued to pursue after 1945 as well, were of potential military relevance, such as his analyses on ferromagnetism (for the demagnetization of submarines), as well as on the plastic deformation of metals. See UAG, Kuratorium (hereafter: Kur.), Personalakte (hereafter: PA) R. Becker, as well as Werner Döring, “Richard Becker 60 Jahre,” *Physikalische Blätter* 3 (1947), 393; Günther Leibfried, “Richard Becker,” *Physikalische Blätter* 11 (1955), 319–320.

phenomenon” (or “Wanderschaft”). Between 1946 and 1949 there was a constant flux of physicists among different universities. A noticeable “gradient” arose from military zones with relatively strict denazification policies, such as the American zone and to some extent the Soviet one, to one that was less strict, the British zone.<sup>8</sup>

One example is Fritz Sauter, who had substituted for the emigré Max Born at Göttingen in 1934. In 1937 he went to Königsberg where he became full professor of theoretical physics in 1939. Two years later he got a call to Munich, only to lose this prestigious position in 1945. Returning to Göttingen in 1948, he requalified himself for academic teaching a year later by repeating the habilitation degree process and was promoted to a position as assistant in 1950 (which was, of course, still quite a step down from the professorial chairs he had held until the end of the war).<sup>9</sup> Another example of a physicist who could return onto the university stage in 1949, after ducking out of sight during the denazification period, was Max Schuler in Göttingen’s Institute for Applied Mechanics, to whom we will return later. The only Göttingen physicist who was dismissed during the denazification period was the lecturer Karl Heinz Hellwege (1910–1999). In 1935 he had become assistant to Georg Joos in the Second Physics Institute. Five years later, Joos had argued that Hellwege’s work there was indispensable to the war effort; it thus received the coveted “*uk*” (*unabkömmlich*) designation, which successfully prevented his being drafted.\* When Hellwege became director in 1941, he even arranged that, “by decree of the Command of the Hannover Military Zone of May 30, 1941, the Second Physics Institute has been approved as a special operation of the armaments industry.”<sup>10</sup> He lost his lectureship in 1946 because of his party membership and his military ranking as *Oberscharführer* (squad leader) in the SA.\*\* But in 1949 his permission to teach was reinstated, and by application of the Faculty of Mathematics and Natural Sciences, he was promoted to associate professor. In the University Council’s minutes, his promotion was justified curtly as follows: “The latter holds a habilitation degree since 10 years. He was an SA-trooper. The Council grants the application.”\*\*\*

Another reason for the “migration” phenomenon that was entirely unrelated to the denazification process was the shrinking of “Greater Germany,” with the attendant loss of German academic posts. Siegfried Flügge (1912–1997), for

\* Indispensable “especially now with his work on Wehrmacht projects” (“insbesondere jetzt durch Bearbeitung von Aufgaben der Wehrmacht”). See the letter by Joos to the Dean of July 7, 1942, or the confirmation signed by Dr. Ruprecht, UAG, PA Hellwege, dated May 21, 1941, according to which Hellwege worked for the signals research command station for the navy on a research project that was assigned the highest urgency ranking SS, presumably in connection with his habilitation thesis topic of longwave infrared radiation, and for which he was also awarded the war medal for distinguished service in November 1944.

\*\* He was put in charge of the SA Reitersturm 6/57. On March 1, 1947, Officer Geoffrey Bird gave the following reasons for his dismissal: NSDAP 1937, Oberscharführer 1936, NSD 1943, SA 1933; Panel opinion: ardent Nazi.

\*\*\* UAG, Senatsprotokolle 1945–49, entry of November 2, 1949, No. 11; based on a resume of Hellwege’s from end of 1937 in the file UAG 5250/6A, he had studied physics at Marburg, Munich, Kiel and Göttingen, 1934 passed the teachers state examination and 1935 took his doctorate at Göttingen with a thesis on the influence of mechanical tensions on the electrical resistance of chrome-nickel wires.

example, left Königsberg (now in the Soviet Union), and Carl Friedrich von Weizsäcker (born 1912) lost his position at the University of Strasbourg (now in France).

Göttingen was also where most of the former members of the Uranium Club (*Uranverein*) went in early 1946 after their release from Farm Hall near Cambridge, England, where they had been confined since the end of the war for their involvement in the secret German nuclear research program to design a “uranium machine.” Max von Laue, Werner Heisenberg, Carl Friedrich von Weizsäcker, Karl Wirtz, Erich Bagge, and Otto Hahn came to Göttingen. The first four even gave lectures at the university.<sup>11</sup> They came to Göttingen mainly because of the relocation of the Max-Planck Society from Berlin to Göttingen and the refounding of the Max-Planck Institute of Physics there. The majority of these newcomers, however, viewed the provincial university town of Göttingen as only an intermediary stop in their professional careers. Immediately after the war, Göttingen acted as a collecting basin, from where one could safely keep an eye out for new job opportunities.

Strikingly absent from the postwar university stage in Göttingen were those professors and lecturers who had lost their positions in 1933 for racial and political reasons. Only a handful of them even attempted to regain their former posts, and these few were not welcomed with open arms. From among the lecturers, the former *Privatdozent* Düker (from psychology) was, as far as we can see, the only one to be granted a position at the University of Göttingen after 1945.

The minutes of the University Council’s meeting of June 9, 1945, record its discussion about the best strategy to pursue regarding the academic teachers who had left in 1933, whether voluntarily or involuntarily:

The listings of the members of the teaching staff who had resigned for political reasons ... are presented and discussed. Clean copies of them should serve as a basis for a collection of all the details about their whereabouts, etc. The opinion is unanimous that these resigned persons should not necessarily be appointed to positions at Göttingen merely for the sake of rehabilitation – rather only in the course of an appointment procedure with the goal of acquiring the very best.<sup>12</sup>

Thus, immediately after the war, leading German academics evidently were already excluding the full restitution the Allies were demanding of German universities. At best, they only deemed desirable the filling of vacancies with the “very best” of their expelled colleagues. Correspondingly small was the number of scientists who eventually found their way back to their former workplaces, and correspondingly sluggish were the restitution proceedings, which frequently only came to a close during the following decade with the payment of pensions or compensation.<sup>13</sup> One person who had suffered a particularly hard fate during the National Socialist period but who *was* deemed as one of the “very best” was the nuclear physicist Fritz Georg Houtermans (1903–1966). Houtermans had studied in Göttingen under James Franck and then became his assistant in 1927. A year later he took up a position in the Berlin Technische Hochschule, where he obtained his habilitation degree in 1932 but then was compelled to leave the following year for racial and political reasons. Thus started his long odyssey. He emigrated to

England, then went to Russia, where he was deported back to Germany in 1940 only to be arrested immediately by the Gestapo for his membership in the Communist party. Only thanks to Max von Laue and Paul Rosbaud was he able to avoid being sent to a concentration camp, by being assigned to war-related research in Berlin, first in Manfred von Ardenne's laboratory and then in the Physikalisch-Technische Reichsanstalt. After the war, he became Richard Becker's "guest" in the Theoretical Physics Institute in Göttingen. He requalified himself for academic teaching, then submitted a petition for an appointment as extraordinary professor "in token compensation for the injustice done to him."<sup>14</sup> In October 1948 he obtained a supernumerary lectureship, being recommended to the Minister of Culture of Lower Saxony as "one of the best versed in radioactivity and the related field of nuclear transmutations." In addition, Houtermans did important work on radioactive dating of minerals (which made possible, for example, a better estimate of the age of the Earth).<sup>15</sup> In 1952 he accepted a call to the University of Bern when the negotiations to keep him in Lower Saxony ran aground because the state coffers were empty.<sup>16</sup>

Altogether, the tenured physics personnel at the University of Göttingen was not hit very hard by the denazification process: only one lecturer (Hellwege) temporarily lost his position, while there was not a single dismissal among the professoriate. To set this in proper perspective, compare this with the available statistics on the overall effect of denazification at the University of Göttingen: 28% of all professors, and 34% of all other lecturers were dismissed temporarily, but because of formal complaints and a gradual weakening of the criteria applied for dismissals, by 1947 these percentages had been reduced to only 16% of all professors and only 22% of the other lecturers.<sup>17</sup> Moreover, because of the liberal education policy of the British university officers in the early postwar years, many additional researchers, (28 professors and 96 other lecturers) were newly hired, many of whom presumably were "migrators" (*Wanderer*) from other occupation zones where denazification was handled more strictly. By the end of the 1940s, however, all such differences among the four occupation zones more or less had disappeared, even with respect to the Soviet zone, notwithstanding the Soviets' rhetoric about "anti-Fascist cleansing."

### Research Topics after 1945

A survey of the research topics of Göttingen physicists is provided by a list they sent at the end of 1945 to L. A. Sutton, the Allied Control Officer for the University of Göttingen. It was initiated by the commissioned director of the Aerodynamic Design Testing Station, Mr. Goody. In October 1945 he informed the Dean of the Faculty of Mathematics and Natural Sciences that a number of English scientists wished

gradually to reopen scientific contacts with their German professional colleagues. In order to pave the way for such a thing, there is a desire in England, first to be informed about the results of important research projects that have been con-

**Table 1.** List of the research reports of the Göttingen physical institutes, November 1945; from Universitätsarchiv Göttingen, Mathematisch-Naturwissenschaftliche Fakultät 56

Institute for Applied Mechanics	Schuler	Collective report (time measurement – pendulum clocks – gyroscopes – control engineering)
Second Physics Institute	Hellwege	Term splitting and electric dipole radiation
	Severin	Spectra of hydrated solid salts of erbium
	Dietrich Meyer	Interaction between $4f^n$ hydrated electrons and the crystal lattice
	Yu Kang Chow	Kramers-type degeneration and J-values in the spectrum of crystalline $NdF_3$
Institute for Applied Electricity	Zahn and Severin	Collective report (diffraction of electromagnetic waves at metallic blends)

ducted in the last few years in a number of the Göttingen institutes but which have not yet been publicized, or only incompletely so, in professional journals.<sup>18</sup>

In response, the following research reports were sent: Table 1 includes all of the research topics pursued in the Göttingen physical institutes up to the autumn of 1945 that were supposed to figure as “important” to the Allied scientists (and clearly, at the same time, were politically harmless). In addition, in Table 2 we

**Table 2.** List of the research projects of the physical institutes, September 1945; from Universitätsarchiv Göttingen, Mathematisch-Naturwissenschaftliche Fakultät 56 (in original English)

Institute for Applied Mechanics	Mechanical vibrations and waves	Dr. Stellmacher
	Gyroscope regulators	Prof. Schuler
	Measurement of time	Prof. Schuler
First Physics Institute	Investigations of optical properties and electric conductivity of crystals	Prof. Pohl, Prof. Mollwo, Dr. Stöckmann
Second Physics Institute	Mass spectroscopy	Dr. Walcher, Dr. Paul, Dr. Brix
	Research on atomic spectra	Prof. Kopfermann, Dr. Meyer
	Research on fast electrons and hard x-rays	Prof. Kopfermann, Dr. Paul
	Research on spectra of the ions of rare earth crystals	Dr. Hellwege
	Research on gaseous discharges	Dr. Walcher
	Research on natural and artificial radioactivity	Prof. Kopfermann, Dr. Paul, Dr. Walcher
Institute for Theoretical Physics	Theoretical work on the following fields of investigation: thermodynamics, electromagnetic field, quantum theory of radiation	Prof. Becker
	Theory of electron astrophysics	Prof. Flügge
	Ferromagnetism, quantum theory of radiation	Prof. Döring
Institute for Applied Electricity	Works out of the sphere of the piezoelectricity, dielectric constants, conductivity of electrolyts, transformation of amorph[ous] metals into crystalline form	Dr. Severin

present a list of research topics that had been sent to the Military Government a month earlier, in September 1945, to ask for permission to continue independent scientific research. This was in accordance with Control Council's regulations, after the physical institutes had been officially "released as largely demilitarized" in mid-May 1945.\* In connection with this listing, the Dean remarked (in English):

All these themes have been gone into in detail by an Allied Scientific Committee, and been agreed by them as de-militarized research themes for the case of research to be reopened.\*\*

It seems remarkable that the Allies approved the research by Wilhelm Walcher and Wolfgang Paul on isotope separation. Thus, it seems that (in contrast to the non-university Aerodynamics Testing Station) the physical institutes of the University of Göttingen were unaffected by the Allied Control Council regulation no. 25,<sup>19</sup> which contained a long list of applied scientific fields for which research was categorically forbidden (including applied atomic and nuclear physics, aerodynamics, and remote-control guidance systems).

To gain a sense of the change in research topics compared to those before the end of the war, we can refer to a bill issued by the industrial firm Mauser-Werke in the amount of 910 reichsmarks, which still awaited payment in 1951, and which prompted the following explanation by the theoretical physicist Günther Leibfried (1915–1977):

The situation is as follows: During the war, the Institute for Theoretical Physics received a research commission of 100,000 reichsmarks from the Research Headquarters of the Luftwaffe. The commission concerned research on ballistics development and I was the specialist in charge. In the course of the project, the Mauser-Werke delivered a number of machine-gun barrels for testing purposes. This bill was left unpaid, however, because at the end of March 1945 the Research Headquarters stopped making the necessary remittances to the Institute.<sup>20</sup>

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\* There are, of course, numerous other contributions from Göttingen to the *Fiat Review of German Science 1939–46*, which had been compiled in 1947 by order of the Field Information Agency, Technical, of the Military Government of the British, French and U.S. Zones of Germany for final publication in 1948. Among the physics topics they include Richard Becker on ferromagnetism, Fritz Georg Houtermans on neutron detection techniques, Hans Kopfermann on atomic physics and hyperfine structure, Wilhelm Walcher on isotope separation in small quantities, and Albert Betz, Walter Tollmien, and Ludwig Prandtl on aerodynamics.

\*\* The above-mentioned research topics thus widely involve the continuation of already existing projects. "Research work on the subjects mentioned has been continued up to the occupation of Göttingen by Allied troops. Concerning items 3 and 6 only preparatory work has been done. It may be added that all research work the continuation of which is proposed has in the past being considered as fundamental research exclusively and was not underlying any restriction concerning publishing of any details of apparatus and results. All work done as far as it has been finished has been published or is in print at present" (original in English). Kopfermann to Sutton, December 11, 1945, UAG, Math.-Nat. Fak. 56, with reference to Sutton's inquiry with 5 questions, dated November 23, 1945.

Such “ballistics development” had vanished from the physics institutes’ new research profiles. Not so for other topics, which to informed persons had obvious military relevance. Examples include “gyroscopes” and “control engineering,” one of the specialty areas of Max Schuler at the Institute for Applied Mechanics, who had contributed to the development of torpedo guidance systems before 1945 and had received support totaling 35,000 reichsmarks for these efforts.<sup>21</sup>

### Course Offerings\*

Particularly in applied physics, there was a tradition of carrying out militarily relevant projects at Göttingen. The end of the war brought about a dramatic change here, especially in one area: When the British closed down the Aerodynamics Testing Station in 1945, all research and teaching in that branch of science came to a standstill. Even though the Testing Station was reopened in 1953, the first pertinent lecture course to be offered at the university was in the winter term of 1955–1956, on Airfoil Theory. As in this case, the focus generally changed from applied to fundamental research. Thus, the lecture course on Applied Electricity was replaced by one on Electroacoustics and High-Frequency Engineering. In 1949 the Practical Session in Mechanics was eliminated completely.

Continuity characterized many of the courses in experimental and theoretical physics, although the choice of courses was noticeably thinner during the war years: The introductory course on Experimental Physics and the Physics Laboratory sessions, for instance, continued without interruption between 1932 and 1955, just as did most of the other courses (including those on Optics, Thermodynamics, Solid-State Physics, Atomic Physics, Spectroscopy, and Applied Mechanics). Relativity Theory, however, which the “Deutsche Physik” movement had spurned as a “great global Jewish bluff,” marks a conspicuous discontinuity.<sup>22</sup> Between 1934 and 1946 it was officially struck from the curriculum. It remains unclear, though, to what extent it continued to be covered informally in the Electrodynamics lectures and discussion sections, as the astronomer Otto Heckmann and the physicist Fritz Sauter contended after 1945. Only in the summer term of 1946 did Richard Becker again announce a lecture course on Relativity Theory, even though it had regained official “political correctness” already six years earlier, in November 1940, at the so-called “Munich Synod” convened by leading German science teachers.<sup>23</sup> Quantum Theory and Quantum Mechanics, by contrast, were taught every third semester on average during the Nazi regime. During the postwar period, from the summer term of 1946 onwards, there was a veritable boom in quantum theory, with a total of seven courses in six succeeding semesters, which certainly attests to a latent demand for instruction in this area.

After 1945 the following lectures, which imply a more broadly conceived training goal, were reinstated: History of Physics and Didactics of Physics, (Natural)

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\* Based mainly on the published course catalogs of the University of Göttingen. We are aware that these preprinted lecture announcements do not always reflect exactly what was actually offered (owing in part to last-minute alterations, etc.), and so we verified and supplemented the information as best we could on the basis of the university archive files.

Philosophy and Philosophy of Science.\* These subjects were taught by the recently released internees at Farm Hall, with the exception of the didactics course, which was held by Ernst Lamla.\*\* Max von Laue devoted himself to the course on the History of Physics, a subject on which he published a small book, and Carl Friedrich von Weizsäcker offered the very well-attended courses on Natural Philosophy.

As respected specialists in their fields, von Laue, von Weizsäcker, Werner Heisenberg, and Karl Wirtz also gave lectures on theoretical physics. Heisenberg, for example, lectured on Quantum Mechanics, Nuclear Physics, and Neutrons; Wirtz also lectured on Neutron Physics, Cosmic Radiation, and Atomic Physics; von Weizsäcker lectured on Relativity Theory and von Laue on Superconductivity. With this lecturing activity they brought new fields into the Göttinger curriculum. But there also may have been another motivation; these scientists employed at the Max Planck Institute in Göttingen may have hoped to find suitable doctoral candidates. At any rate, for a few years after the war there was a tendency toward a more general education. Von Weizsäcker explained:

Lectures with very general content for students from all the Faculties find much success nowadays. Evidently, there is a demand for them. Where does this demand come from?

The lurking danger in the specialization of the sciences is being felt more and more acutely. The boundaries erected between the subjects have become oppressive. Science specialties are incapable of giving us a worldview that could offer us any firm support in our bewildering lives. That is why synthesis is being sought, the greater picture is wanted.<sup>24</sup>

The extension of the curriculum toward more generalized studies was specific to Göttingen. In addition to Philosophy and Didactics, we find here the first lectures on the History of Physics by Siegfried Flügge and Max von Laue – a strand that broke off in 1950, but was again taken up in the 1990s.\*\*\*

### Student Statistics

As seen in figure 2, the number of physics students at the University of Göttingen fell sharply over the period 1932 to 1942. At its lowest point, only 26 students chose physics as their major.\*\*\*\* This trend appeared not only in Göttingen but through-

\* Cosmogony, Philosophy of the Quantum Sciences and Mathematical Sciences, Lectures on Kant and the Origins of the Planetary System.

\*\* From 1947 Director of the preparatory school Max-Planck-Gymnasium.

\*\*\* One exception after 1950 is Arnold Flammersfeld's lecture course in the winter term of 1955–1956 on the history of modern physics (since 1880).

\*\*\*\* The great majority of the some 900 students to partake in physics instruction in the winter trimester of 1940 were medical students (about 700), as we learn from a letter by Georg Joos to the then Rector Sommer. Owing to the great popularity of this field during the second world war, their numbers had risen five-fold since the winter term of 1938–1939. Among the remaining 200 students who attended physics courses, about 170 were chemists and 5 were from other fields; hence a total of only 25 were registered physics majors.

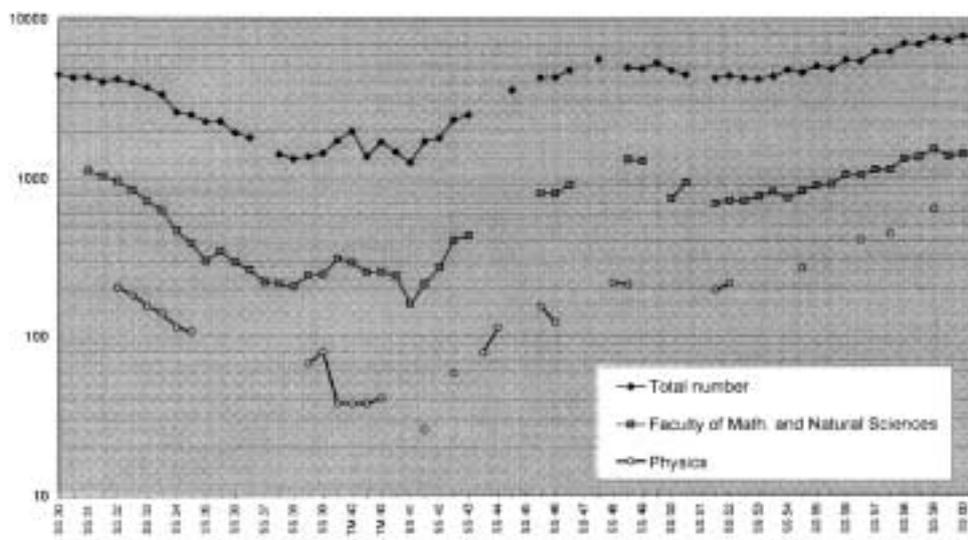


Fig. 2. Number of students at the University of Göttingen 1930–1960.

out the German Reich. In the final years of the war, the number of physics majors rose again because of last-minute efforts to increase the number of personnel in war-related research.

Immediately after the war, as shown in Table 3, a total of 153 physics students registered in the programs for a Bachelor of Science (*Diplom*),\* a doctoral degree (*Promotion*), and teacher training (*Lehramt*); among these, 15 were women.\*\* This

**Table 3.** Immatriculated students at the University of Göttingen in the winter term of 1945–1946; all entries based on Universitätsarchiv Göttingen, Mathematisch-Naturwissenschaftliche Fakultät, folder 19b

	Physics majors		Teachers
	Male	Female	m + f
Beginning (prior to <i>Vordiplom</i> )	50		14
Advanced	52	4	11
Pre-examination	12	4	3
Ph.D. candidates	2	1	
Subtotal	116	9	22+6
Prospective teachers	22	6	
Sum	138	15	

\* This degree had been introduced into physics in 1942.

\*\* The proportion of women was 10%, thus half that in the Mathematics and Natural Sciences Faculty as a whole (21.1% of a total of 773 students). All of the above statistics are from UAG, Math.-Nat. Fak., folder 19b.

was a sharp rise compared to the drastically reduced numbers during the war. The reason was that, as one of the few German universities to survive the war almost completely intact, the University of Göttingen attracted students from throughout the former Reich. In addition, Göttingen's border location led many new refugees from the Eastern regions of the former Reich to move to this university town.

To fend off a deluge of students who were anticipated to matriculate in the winter term of 1945–1946, the university was willing to use any means possible. The Rector Rudolf Smend issued the following warning to prospective students in August 1945:

Owing to the particularly bad career prospects, studies in medicine, physics (bachelor of science), chemistry (bachelor of science), and German literature are severely discouraged. This caution applies particularly to female students. Even exceptionally gifted young students can scarcely hope for a materialization of their career plans.<sup>25</sup>

Despite Smend's warning, the final numbers were enormous: over 12,000 students applied for admission, of which 4,296 students were accepted. This prompted the question of how to regulate the selection process.

To do so, a six-months' Basic Studies Program was introduced to accommodate the low academic level of new applicants, all of whom were required to participate in it, as well as all students in their first or second terms who had interrupted their studies for more than three years, and any other students required to do so by a particular Faculty.\* On completion of the program, the students had to pass an entrance examination that was under the control of that Faculty. The Dean of the Faculty of Mathematics and Natural Sciences, Arnold Eucken, placed special importance on aptitude (logical thinking) and strong character; he also rejected female students on principle: Among the 200 matriculated students in physics, only 5 were women.<sup>26</sup>

During denazification, an attempt was made to link political screening to university admission, categorizing applicants into five groups, based on their political involvement during the Third Reich:

- A: never a member of the Hitler-Youth (HJ), *Bund Deutscher Mädels* (BDM), or NSDAP, never an applicant to any of these organizations;
- B: never a member, but was an applicant for membership in one of these organizations; OR was a member but not a leader (*Führer*) in the HJ or BDM;
- C: not an "active member" of the NSDAP;
- D: was an active member of the NSDAP or one of its subsumed organizations; and

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\* Science and mathematics majors had to take 4 hours of class each in German and mathematics plus four hours in English or French. Dr. Glaß in a letter dated September 26, 1945, by the Zentralinstitut für Erziehung und Unterricht; letter by the senior president of Hannover, September 1, 1945, UAG, Rek. 7101.

E: “those who otherwise fall under the denazification regulations of the Military Control Authorities.”

But admission was based not only on this classification scheme. While the British Military Government insisted on this political screening and classification, whereby the last two groups were barred from university education,<sup>27</sup> German professors and government officials attempted to make academic qualification the more important criterion. This is apparent in a draft statement by Arnold Eucken<sup>28</sup> that discussed the fundamental principles that definitely ought to be adhered to:

In the selection of academic teachers and in the evaluation of students, their academic achievements alone are crucial, whereby under all conditions, a completely unobjectionable personality, and above all, absolute honesty, are taken as a prerequisite.<sup>29</sup>

Professor Ludwig Prandtl, the famous Göttingen aerodynamicist, feared that the directive on student admissions of the Military Government would encourage mediocrity. In a letter to the Rector in April 1946, he suggested taking achievement into account in the decision process and cleverly linked political classification to considerations about talent:

In this regard it must be pointed out, in particular, that boys and girls under 20 years of age really are completely immature in political matters and that it is therefore wrong to make admission or non-admission to the university dependent upon the decision by boys and girls whether or not to accept a ranking conferred upon them, such as Squad Leader, or the like; whereby refusal in the familiar Nazi Party system often tended to be linked with the most troubling difficulties. In reality, it is true that precisely those who stood out among the crowd for their quick comprehension and greater proficiency were the ones noticed by the more highly placed leaders; and they could not have been naïve boys and girls then, if they did not simply feel childishly pleased about this acknowledgment. And now this acceptance is supposed to spell their doom. This situation would be completely saved, if the regulation were implemented such that obviously above-average talent be treated in the sense that applicants be transferred into the next higher group, hence B to A, C to B, and D to C.<sup>30</sup>

Prandtl's suggestion was actually followed. How this occurred in practice is apparent from a Matriculations Committee report dated July 10, 1946. During 24 meetings of the Committee that were held in a three-month period, 350 cases were examined and 68 personal interviews were conducted. Of these, 289 cases, *i.e.*, more than 80%, were moved to a higher ranking – according to Prandtl's scheme, all would seem to have been above-average students. The political information taken from the questionnaires for classification purposes was not checked for accuracy. The Committee emphasized that it evaluated each case “conscientiously, but at the same time, benevolently.”<sup>31</sup> The result was that about 30 percent of the matriculating students were former military officers or reserve officers – a figure that should be

compared to the less than 2 percent at the University of Braunschweig. Political screening came to a complete halt with the amnesty for young students (those born after 1919), that went into effect on August 22, 1946, in the British Zone. By that time, only extreme cases were excluded, the so-called “notorious Nazis.”

Between 1945 and 1949 the total number of students at the University of Göttingen was limited to between 4,500 and 5,000; thereafter only the number of new enrollees was limited. During this same period, the total number of physics students climbed from 150 to about 250. When the admissions restrictions were abolished in 1953, there was a steady rise in the total number of students, and one that was particularly strong in the field of physics.

### **Complementary Biographical Cases: Hohenemser and Schuler**

The conspicuous complementarity of the careers of Kurt Hohenemser and Max Schuler invites closer examination, particularly since their political circumstances were clearly the source of that complementarity. The high point in the university career of one corresponded to the low point in that of the other, the pivotal points in their career lines reflecting the political swings in 1933 and 1945, which then were followed by a gradual leveling off in the denazification period.

Kurt Heinrich Hohenemser (figure 3) was born in Berlin on January 3, 1906, as the only son of the Jewish musicologist Richard Hohenemser and his Protestant musician wife Alice, née Salt.\* He received his doctorate from the Darmstadt Technische Hochschule in June 1929, and from then until April 1930 he was a supernumerary assistant in the Aerodynamics Institute at Darmstadt. He then carried out research at the University of Göttingen under Ludwig Prandtl, and in February 1932 completed his habilitation degree in applied mathematics and applied mechanics in the Faculty of Mathematics and Natural Sciences.

In January 1933, Prandtl submitted a proposal to the Curator of the University of Göttingen to appoint Hohenemser to a regular assistantship on April 1. Prandtl’s proposal was approved, and Hohenemser gave his oath of allegiance to the Imperial and Prussian Constitution on April 3, 1933. Then, just four days after his entry into the civil service, the Nazi Law for the Restoration of the Professional Civil Service was decreed, with Section 3 of that notorious law requiring the dismissal of civil servants of Jewish origin. As a result, Hohenemser immediately lost his post. After many failed attempts by Prandtl – the Director of the Institute for Applied Mechanics – to fill this position with one of his coworkers (who all fell victim to the new law), he was forced to hand over the directorship of the Institute in April 1934 to Max Schuler, who filled the assistantship position with his former doctoral student and National Socialist party member Erich Hahnkamm.

Hohenemser subsequently managed to find employment in industry as a scientific consultant and thus found no immediate need to emigrate. He first took a position at the end of 1933 in the airplane-manufacturing plant of the stunt pilot Gerhard Fieseler near Kassel, and after 1935 until the end of the war he worked for Anton Flettner, in Berlin, later in Silesia, as an advisor on helicopter development. The military importance of these projects brought Hohenemser not only a *uk* priority but also protection from internment in a concentration camp.



Fig. 3. Kurt Hohenemser (born 1096).



Fig. 4. Max Schuler (1882–1972).

The situation was very different for our second case, likewise a member of the Institute for Applied Mechanics at Göttingen. Maximilian (Max) Joseph Johannes Eduard Schuler (1882–1972) distinguished himself with his construction of the world's most accurate pendulum clock. He studied engineering design at the Technische Hochschule in Munich, and in 1907 joined the gyroscope design company of his cousin Hermann Anschütz (1872–1931) where three years later he was promoted to Technical Director. In 1921 he defended his doctoral thesis on the gyro-compass, and in 1924 he received his habilitation degree in the field of mechanics at the University of Göttingen.<sup>32</sup>

In 1928 Schuler (figure 4) was appointed as an untenured associate professor of applied mechanics. Despite this appointment, he had difficulty securing teaching assignments. In 1929, for instance, his application for teaching a course on the theory and application of the gyro-compass was declined, the stated reason being a lack of funds. His letter of protest resulted only in a second refusal. In 1932, even his application for an unpaid teaching assignment on oscillation theory and the gyroscope was turned down. Any resentment he might have harbored earlier toward the decision-makers could only have intensified as a result of this second

\* This information, especially with regard to his parents' religious affiliation, according to a letter by Kurt Hohenemser to Klaus Hentschel, November 21, 1998. Both parents committed suicide in early 1942, after the SS had threatened them with confiscation of their Berlin apartment.

rejection. His academic profile was that of a typical engineer, a practical technician within the context of a strongly theory-dominated Göttingen physics community during its heyday in the Weimar Republic. Thus he had reason to welcome the National Socialist disruption of the university status quo.

With the change in government in 1933, Schuler's position improved perceptibly. In November 1933 he became a supporting member of the SS (No. 216,917); in July 1934 he became a member of the association for university teachers within the National Socialist Teachers League; in July 1935 he became a member of the National Socialist People's Welfare Organization as well as other party organizations, albeit not a member of the National Socialist German Workers Party itself.<sup>33</sup> As early as on April 9, 1934, on the proposal of the Faculty for Mathematics and Natural Sciences and the University Rector, Schuler was assigned the supervision of the Institute for Applied Mechanics "until further notice."<sup>\*</sup>

Schuler attempted to strengthen his own position and to expand the range of the Institute. In 1934 he was still an untenured associate professor; in 1938 he submitted a proposal to establish a regular full professorship for applied mechanics subsuming the Institute directorship. He justified this proposal by arguing that the current situation "cannot be considered acceptable with respect to the Faculty's responsibilities in technology and armament." The university teachers association of the National Socialist Lecturers League supported his proposal and supplied a character reference and the necessary official statement on his political reliability. His appointment as a tenured professor extraordinary followed on September 28, 1939.<sup>\*\*</sup> Four months later, on February 6, 1940, he was appointed Director of the Institute for Applied Mechanics and thus reached the pinnacle of his career.

At the end of the National Socialist regime, Schuler was 63 years old, and as a member of the SS, he was seriously implicated in it. He responded initially by lying low and waiting. Then, in May 1946, prompted by the Military Government, he submitted an application for early retirement, basing it on his "currently poor state of health."

Schuler's retreat from an active academic career was exactly mirrored by Kurt Hohenemser's return to one. In January 1945 Hohenemser had fled westward from the advancing Soviet army with his wife and two children, then 5 and 8 years of age. They lost all of their possessions in Silesia and found shelter in a refugee camp in the south of Germany.<sup>\*\*\*</sup> On June 25, Hohenemser submitted an application to return to his regular assistant position in the Institute for Applied Mechanics at Göttingen from which he had been expelled in 1933. He elaborated on the situation at that time:

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\* Schuler's assistant Hahnkamm was pivotally involved in this change in directorship. Prandtl, who had "voluntarily" resigned his post and suggested Schuler as his successor, admitted in 1945 that at that time he had been under some pressure and otherwise would not have recommended Schuler.

\*\* These events according to UAG, Rek., PA Schuler. Regarding the armament projects, Schuler was alluding primarily to his researches on the automatic guidance of torpedos by means of gyroscopes.

\*\*\* The camp was in the Bildhausen cloister near Münnerstadt.

Prof. Prandtl then had the directorship of the Institute ... . Through the arrangement of Mr. Gengler, then the assistant of Professor Schuler and later [party] regional leader for Göttingen, the directorship of the Institute for Applied Mechanics was taken away from Prof. Prandtl and assigned to Professor Schuler, who is still actively the director at this time.<sup>34</sup>

Thus, a raft of issues was opened that turned into a ferocious dispute between him and Schuler, who apparently had been informed immediately of his accusations. Schuler responded as follows:

1. He had never been a member of the Nazi Party.
2. He had never discussed his position with the regional leader Gengler.
3. He was certain that Gengler had nothing to do with his nomination and appointment.
4. Gengler had not been his assistant but Professor Hans Kienle's at the Göttingen Observatory.
5. "With one exception," he had "never" discussed politics with Gengler. That one time he had frankly told him "that the Party ought not to do such foolishness by coercive means."<sup>35</sup>

Hohenemser's attack, which Schuler regarded as deeply insulting and defamatory, served as the occasion for Schuler to submit a petition that Hohenemser not be granted permission to teach at the university again. He also rejected the very idea that Hohenemser should be reemployed, "after Hohenemser has insulted me in such a shameless way." At the same time, he promised not to cause Hohenemser any trouble if he applied for the *venia legendi* (the right to teach following the award of the habilitation degree) or an assistant position at another university. In July 1945 Hohenemser responded with more specific accusations against Schuler. By then, the conflict had escalated to the point that mediation efforts by the Rector and Dean were to no avail.

From today's vantage point, we can only confirm Hohenemser's story on the basis of the university files, to which Hohenemser himself, of course, had no access. These files reveal that the University Council and the Faculty of Mathematics and Natural Sciences, in particular its Dean Arnold Eucken, gladly interpreted the dispute in Schuler's favor and evidently had no interest in exposing him. The old boys' network of some of these far-rightwing physicists who were in power at the time worked against those who were perceived as outsiders and intruders.

At the end of March 1946, however, Hohenemser's permission to teach was returned to him. The minutes of the Faculty Council record that he accepted the reinstatement of his former position and received a supernumerary lectureship. He had discussed his reemployment with Ministerial Councillor Zierold in Hannover, a liberal science politician, who had promised him a regular assistantship or a supernumerary lectureship. Further, the minutes record: "Mr. Schuler will come to an agreement with the Curator about the details of the working conditions [of Hohenemser] at the Institute for Applied Mechanics."<sup>36</sup> Since Schuler already had done everything he possibly could to prevent Hohenemser's return to "his" institute, one can easily imagine the kind of agreement he reached with the Curator.

In the end, Hohenemser's petition for reemployment at Göttingen foundered on the stubborn resistance of Schuler, which was supported by the Faculty under Dean Eucken – despite Schuler's retirement in 1946.<sup>37</sup> Hohenemser joined his former employer, Anton Flettner, in the United States in the summer of 1947, but Flettner's plans to construct an airplane factory there fell through, and Hohenemser found another job as chief aerodynamicist in the helicopter division of McDonnell Aircraft in St. Louis, Missouri. Beginning in 1957, he also taught on the side as visiting professor at Washington University in St. Louis. After 1963 until his retirement in 1974, he taught there as full professor of aerodynamics and applied mechanics. Thus, ironically, Hohenemser essentially was forced to emigrate *after* 1945, even though he had managed to stay in Germany throughout the dozen years of the National Socialist regime.

Hohenemser was listed as on leave from the University of Göttingen until 1950; thereafter his *venia legendi* was revoked, and he left the ranks of Göttingen *Privatdozenten*. Hohenemser appealed that decision unsuccessfully. Restitution negotiations with Hohenemser were opened only in the summer of 1956; they ended with the granting of a pension to him as a retired full professor.

What about Schuler? One might think that the dramatically new political circumstances in 1945 ended his career. In 1949, however, after the unofficial termination of the denazification process in Germany, Schuler rose again like a phoenix from the ashes. He requested permission from the Allied Control Authority to exercise his right, as a professor emeritus, to give lectures, which was granted. That this was not simply a resumption of his teaching activities because his health had improved is revealed in his petition to the University Curator, where he mentions that “earlier, the Military Government did not want any lectures from me.”<sup>38</sup>

On January 25, 1963, Schuler received the order of merit from the Federal Republic of Germany, in acknowledgment of his scientific achievements. Hohenemser, needless to say, never received any such distinction from his country of birth.

## Conclusions

On the staffing level and with regard to research and teaching, there was remarkable continuity at the University of Göttingen in 1945. Even the few scientists who had been “screened out” during the denazification proceedings in 1945–1946 mostly managed to return to their research and teaching by 1949 – if not always at the same post – thanks to the strong backing of their home colleagues. Obversely, this solidarity worked against those who had been driven from their posts in 1933. They were looked upon as outsiders who would not “understand” what had happened during the intervening years. In extreme cases such as that of *Privatdozent* Kurt Hohenemser, they were regarded as intruders whose return would disrupt the peace within the institutes, because they would not keep their mouths shut about the opportunistic actions of their colleagues who had weathered the Nazi regime. In the face of pressing worries about restoring normal relations after the war, reflections on what had been perpetrated between 1933 and 1945 stayed

almost completely in the background. Whenever any attempt was made to draw attention to the events of this period, such as at the University Council meeting as quoted at the beginning of this paper, the majority felt that the Allies were unfairly imposing self-flagellation on Germans. The vanquished reacted by stigmatizing those who tried to break this taboo. Thus, in the University Council minutes of November 21, 1945, we read:

A Dr. Mommsen has brought scandalous news to Heidelberg: The Göttingen teaching faculty not cleansed. Only [military] officers [have] matriculated. His character must be investigated.<sup>39</sup>

### Acknowledgments

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