

Autobiography of Carl Stumpf

Carl Stumpf (1930)

Classics in the History of Psychology

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INTRODUCTION_

"We scorn construction, love investigation, maintain a skeptical attitude towards the mechanism of a system... We are content at the end of a long life to have tapped various lines of scientific research which lead to the foundation of things; we are content to die on the way." -- *W. Dilthey* (1865).

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To the following "self-presentation" -- the length of which I beg to excuse in view of the length of my scientific service -- I consented only after some hesitation, when I realized on various occasions how difficult it was even for my scientific colleagues and pupils to find the thread unifying my much-ramified writings and to discover the roots of my scientific life-work. I hope this may be facilitated by the following.



I. Biography

I was born on Good Friday, April 21, 1848, in the little hamlet of Wiesentheid in Franconia, and on Easter Sunday I was baptized according to the Catholic rites. My parents were the County Court Physician Eugen Stumpf and Marie Stumpf, née Adelmann. Three brothers have been, and three sisters still are, my tried and true companions in joy and in sorrow. My parents, whose life and care were entirely devoted to the welfare of their children, were still living when I was called to Munich. My grandfather, Andreas Sebastian Stumpf, who died long before my birth, was a well-known Barvarian historian and a member of several academies. My father's two brothers also were active in science, and published works on statistics, biography, and forestry. My grandfather Adelmann, born in 1770, Court Physician in Gerolzhofen, had studied the French literature of the eighteenth century, as well as Kant and Schelling, whose works, with abstracts and notes, were found in his library. After his retirement, he came to live with us and taught me the fundamentals of Latin, and later on followed my progress with interest almost to the university. The Adelmann family, which came from Oldenburg to Fulda and Würzburg, numbered remarkably many doctors among its members. Five of these, among them three university professors, in Dorpat, Löwen, and Würzburg, I knew personally, four others only by name. Thus it may be that the love of medicine and natural science was in my blood. Both of my parents [p. 390] were musical, my father an excellent singer, my mother a good pianist. From them I inherited my love of music.

After a year in the Latin school at Kitzingen, I attended the "gymnasium" in Bamberg from 1859-1863, and the two following years at Aschaffenburg, where my father was transferred. This charming town became our second home.

As I was physically frail, but mentally intense and ambitious, religious, and over-conscientious, my mind developed faster than was really good for my nerves. But fortunately I could spend the first ten years of my life in the country, where not only a spacious yard, but also some farm-work stimulated physical activity. Other physical exercise also had an invigorating effect, such as gymnastics, swimming, and especially hiking with my brothers and sisters through beautiful Franconia, later from Aschaffenburg through the Rhineland and the mountains of central Germany, and still later through the length and breadth of the Tyrol and Switzerland. Walking and mountain-climbing in pleasant company seemed to me one of the most important aims of human existence -- liberating and broadening the spirit -- and the school semester, by contrast, a sort of purgatory preliminary to the heaven of

vacation. Many young people in southern Germany probably feel much the same way. This passion for hiking has stayed with me even to my old age, and undoubtedly has helped me to attain the latter.

I do not remember the studies at the "gymnasium" with much pleasure, generally speaking. I made good progress, but only with considerable effort, as I was a year ahead of my age and did not have a good memory for history and geography. Of my teachers, I hold only two in grateful memory, especially the aged Hocheder in Aschaffenburg, senior professor of the graduating class, who was, incidentally, an impassioned astronomer, and through our study of the *Phaedon* first awakened my love of philosophy and of the divine Plato. I have ever remained, at heart, a disciple of Plato. The instruction in general was anything but inspiring, and even technically unsatisfactory. Mathematics especially was very poorly taught. I had no special talent in that line, but with a sound foundation in school I should probably have made greater progress in it.

There was, however, in the higher institutions of Franconia an excellent opportunity for musical education. Even in Kitzingen [p. 391] from singing in the massbooks, I had learned the old-fashioned notes of the four-line system, and could soon sing at sight in any key.

At Bamberg we had a complete orchestra which met regularly at the free-standing Aula-building for practice under the direction of the excellent conductor Dietz. One could learn to play any instrument, free of charge. At the age of seven, I had commenced to study the violin, and during my student years had several opportunities to play in public. Besides this, I had learned without instruction to play five other instruments with more or less success. When we played or sang together at home, the leadership was left to me, and I formed the habit of hearing music analytically, i.e., by following the single voices or parts.

Quite objectively speaking, I cannot understand how, without this ability, one can really appreciate in polyphonic music the beauty of the pattern, the weaving in and out of the individual voices, composition in the true sense. The copying of notes, which for reasons of economy I practiced assiduously [*sic*], also aided me to gain an insight into the trade secrets of music, as it served Rousseau in a similar manner. In my tenth year I began to compose (my very first work was an oratorio, "The Walk to Emmaus," for three male voices), and during the last years of my course this developed into a dominating passion while I was studying the theory of harmony and counterpoint in the manuals of Silcher, Lobe, and Gottfried Weber. I composed quartets for strings and other pieces, but unfortunately inspiration did not always keep step with labored reflection. The only product of any originality was a scherzo in complete 5/4 time.

Thus, at the age of seventeen, I entered the university with more love of music than of erudition. In Würzburg I followed the proper Bavarian custom of attending lectures on general subjects. The course on aesthetics by Professor Ulrich, the philologist, stimulated me to study the *Kritik der Urteilskraft* from my grandfather's library.

Thus Kant became another of my guiding lights in philosophy. During the second semester I decided to study jurisprudence, not from inclination, but in order to have a profession that would leave me some leisure for music. I diligently attended lectures on institutions and pandects, on the history of Roman and German law. But towards the end of this semester

came the great change, by the addition of Franz Brentano to the faculty. Elsewhere I have already described the complete change which this man's appearance, [p. 392] his personality, his manner of thinking and teaching wrought in me. Everything else vanished before the great problems of philosophical and religious regeneration. Keen thinking had scarcely been in my line so far, and was rather irksome. Only through Brentano's iron discipline the craving for logical clearness and consistency became second nature. All emotional life had to submit now to the laws of reason. This was not to cripple it, but rather to direct it exclusively towards those aims that to us seemed the highest. I was ready to relinquish all worldly happiness for the realization of the ethical-religious ideas of Christianity in my fellow creatures and within myself. This was my condition of mind for four years.

Besides Brentano's lectures, I also took courses in natural science, as he considered both the substance and the methods of science important for philosophy. His dissertation, wherein he presented the thesis that the true philosophical method is none other than that for natural science, was and has ever remained a lodestar to me. In order to attain some practical knowledge along this line, I worked in the chemical laboratory, though with the final result that by some careless reaction I caused a small conflagration which might have spread over the whole building if the attendant had not come to the rescue. I never attained manual cleverness.

In my fifth semester, at Brentano's advice I went to Göttingen to study with Lotze, and to graduate there. How Lotze became my fatherly friend I have likewise mentioned elsewhere. His mental attitude had greater influence on me than Brentano really wished, although the fundamental epistemological lines were always those that Brentano had impressed upon my mind. Besides Lotze's lectures, I also took those of the physiologist, Wilhelm Weber. The latter, besides Brentano and Lotze, developed and formed my manner of scientific thinking. The modest old man, whose whole appearance in the lecture-room seemed at first awkward, even comical, had developed by the most intense mental effort a system of physics, which, better than any logical lecture, revealed to the student the methodology of inductive thinking. His course, which ran through two semesters, I took down in shorthand almost word for word. Ever since, physics has seemed to me the ideal inductive science. Friedrich Kohlrausch's research course introduced me to the technique of investigation. Today such preparation, at least for the psychologist, is a matter of course; but at that time a philosopher [p. 393] in the chemical and physical laboratory courses was a white raven -- a *rara avis*.

My thesis I wrote with a special view to its logical form, and this may have been why Lotze, who at first maintained a skeptical attitude towards my subject and advised against it, in the end changed his mind. The procedure, which I had derived from Brentano, and indirectly from Aristotle, namely, to prepare for the final argument by a complete disjunction of possible opinions and a refutation of all but one, is found in many of my later writings. In preparation for the final examination, I read all the great philosophical classics, howbeit in a very cursory manner, and for my dissertation, the entire Platonic literature. Brentano's oral instruction and writings had naturally given me a pretty thorough grounding in Aristotle's teachings. How seriously the theory of ideas, which gave even Aristotle some troubles and which -- *mutatis mutandis* -- is repeated in modern German idealism, must have tormented me is shown by the cry of despair in my first disputation thesis, "Ideae nomen e metaphysica expellendum esse censeo." It probably did not please Lotze any too well. The same mood inspired also the initial question of a somewhat arrogant little essay during the time I was in Würzburg concerning the psychology of the present time: *Sind wir noch Idealisten?*

After my graduation in August, 1868, I returned to Würzburg to continue my philosophical studies with Brentano and at the same time to begin the study of theology. In the fall of 1869, I entered the ecclesiastical seminary in Würzburg where I was initiated into the liturgical ceremonies of the Church, the ascetic regulations, which I observed most conscientiously, and all the details of religious exercises. The theological lectures gave me no pleasure, except those of the genial old commentator Schegg, who had traveled through the Holy Land and could describe it most vividly. Besides, I studied most diligently Thomas Aquinas and other scholastics; and Hebrew, on account of the Bible. The fact that I now know only the first letter of the alphabet of this language is a striking example of the effect of disuse on memory.

Within the walls of the seminary, however, even in the spring of 1870, the second, still more fundamental regeneration overtook me, and again under Brentano's influence. The whole structure of the Catholic-Christian dogmatic theology and *Weltanschauung* crumbled to dust before my eyes. In terrible agony of soul I had [p. 394] to give up my chosen life work, my ideal. In July, I took off the black robe. I had not been ordained as yet, so there were no serious complications. But I had to find my way back to the world, and many favorable, as well as unfavorable, after-effects of this year I was to feel for a long time to come.

Soon, however, I decided to go to Göttingen to attain an instructorship in philosophy. Upon my entrance to the seminary, Lotze had written me a letter from which I have quoted his religious views in another article, the end of which, however, I shall add here:

"The most important point I approach last. I am far from satisfied with the condition of the Protestant church and theology, and will let your criticisms pass, though I do not approve of them all. I suspect that you do not sanction everything that your church brings forth nowadays (its infallibility). The principle itself I cannot discuss with you, since I as well as you believe that the living faith is the only foundation for it. Your decision to become a priest I can accept only with deep respect for your conscientious conviction, and, although it destroys a cherished hope of mine, still I realize the full extent of the blessing that your strong spirit may carry with it in your calling; I realize this too well to think of opposing your decision in any way. Nevertheless, forgive me, who loves you so dearly, one urgent, rather than serious, request: Do not now in your early youth, which you are still enjoying, take such a decisive step, an irrevocable one, too rashly! Everything else I leave to your good judgment, your consideration; but this one thing I beg of you!"

These words, revealing his respect for every individuality as well as his personal affection for me (he even intended to visit me during vacation in Aschaffenburg or Würzburg), I had treasured like a jewel in my heart, but realized now for the first time how right he had been with his "rather serious" warning. When he heard of my change of heart, he wrote, in a similar vein, that he would consider it indelicate if he should offer to help me, in my inner struggle, with views which originated from entirely different starting-points; that I would fight it out all right by myself.

"There is just one point that is troublesome, which I would mention here: Life is long, and yours,

I hope, will be measured for you as long as for the most favored. Is it, then, necessary to settle all your doubts concerning the most important matter at once? Perhaps you are tormenting yourself too much by meditating incessantly about things which might me put aside for the time being, not that you have declined to make binding decision; then, after your mind has had some rest and recreation, you can return to these problems with a greater calmness, impartiality, and receptiveness."

He approved my decision. During vacation I worked on a dissertation [p. 395] about mathematical axioms and at the end of October, 1870, I became instructor in Göttingen. I have never published this dissertation, as the non-Euclidian way of thinking to which Felix Klein had introduced me was, after all, a little beyond me.

The transition from the seclusion of the convent to the "city of the muses," which in the eighteenth century had produced the "philosophers for the world," and where even now, in spite of the War, sociability flourished, was extremely sudden and staggering. But my youth had enough elasticity to adapt itself, and I soon felt at home in the new milieu. Lotze's house was always open to me, as well as Baumann's and finally Henle's, at whose musical evenings I played the cello in the quartet. He was a man of the most genial humor and of great kindness towards his friends. Even shortly before his death (1885) I received his charming chatty letters. His "Anthropological Lectures" are known for their keen psychological observations. During these years I met besides the famous men of Göttingen, also those two veterans of psychophysics in Leipzig, E. H. Weber and Fechner, the former at the home of his brother Wilhelm, where he showed me on my own body various sensory fields, and the latter on a field-trip with Felix Klein. With Fechner I discussed the difficulties of atomism caused by the unity of consciousness, which he thought to solve by analogy with the unity of the concept. We also served him as subjects for his experiment with the golden section. The personality of these two great men, genuine scientific investigators, made a lasting impression on me. But there was also in Göttingen a fine cooperation among the numerous young minds. My closest friends were Felix Klein and the Scotchman, William Robertson Smith, who as a liberal Bible investigator later on suffered serious persecution in his native country. Klein, who even then felt within him the urge to organize, founded with me the "Eskimo," a society of young scientists, for the purpose of lectures and friendly intercourse, wherein I was to represent the philosophical part. Professors were excluded. The club is still alive -- as far as I know -- but with somewhat modified conditions.

I began my lectures with ancient philosophy, especially that of Aristotle, whom I studied intensively for a whole year. As my first more serious work, I attempted a critical history of the conception of substance, over which I racked my brain most awfully until I abandoned the problem, and, at Easter, 1872, took up the psychological [p. 396] theme of the origin of space conception. In the relation between color and extension I believed, and still believe, to find a striking example or analogue of the relation which metaphysics assumes to exist among the qualities of a substance. Thus the new problem was connected with my old work.

It progressed rapidly, and, in the fall of the same year, the book was printed. It appeared at a time rather propitious for my advancement, as there were vacancies in philosophy in five universities. In Vienna I was considered as a second choice, but at Würzburg, where Brentano and Lotze had spoken for me, an offer materialized, and in the fall of 1873 I was settled in my new position as professor.

It seemed great luck to find a position in a famous university so soon -- especially for the sake of my parents. But there were also certain disadvantages: I had neither enough experience in life nor the necessary scientific maturity for the difficult position. As Brentano has resigned, and the aged Hoffmann, a follower of Baader, found scarcely any listeners, I had to represent, as it were, the whole Department of Philosophy; but with the courage of youth I gave, in turn, all the great philosophical subjects except ethics. The aftereffects of this over-exertion I was to feel for many a year.

In 1874, on a trip through Italy, I met -- besides Bonatelli and Belotti -- the leader of Italian philosophy, that remarkable man, Count Terenzio Mamiani, and his pupil, Luigi Ferri, both of whom asked me casually about the condition of German philosophy. In the same year I took a trip across the Channel with Smith and had an opportunity to fill out (in the British Museum) my knowledge of English philosophy, much of which Smith had already brought to my attention in connection with my book on space. Like Brentano, I delighted in this clear, logical -- if not always profound -- philosophizing, and the keen presentation of contrasts that we find in truly classic style in Mills's book on Hamilton. But Herbert Spencer's constructive manner always seemed tedious to me.

The first scholarly work I undertook was a history of the psychology of association, which was connected with my first-mentioned studies, but I gave it up as I had given up that of the conception of substance, and decided to devote myself henceforth to that field which, connecting my musical experiences and studies with the interests of psychology, seemed to me, personally, the most promising. In 1875 I commenced my work on *Tonpsychologie*.

The excellent [p. 397] collection of acoustic devices at the Institute of Physics was placed at my unrestricted disposal through the kindness of my former teacher Kohlrausch of Göttingen. Besides, I frequently spent days in Hanau with the organ builder, Appunn, who had worked for Helmholtz, and we vied with each other in study and observation. I was well aware, of course, that such absorption in all the details of a field of sensation stood in sharp contrast to the general conception of the mission of the philosopher, although Fechner had been a famous example of this type. When I considered the hopeless condition, as it appeared, perhaps, in Überweg's review of recent philosophy -- ever new systems without any connection with one another, each bent on originality, at least on a new terminology, none of them with any power of conviction -- when I compared this with the evolution of physics, what a vast difference! Might it not be possible for a specialist in philosophy to work together with other specialists, at least in some particular field? If this were done by others in other fields, might there not result finally a beneficial relationship between philosophy and the single sciences?

Thus the time in Würzburg marks for me the beginning of a new line of work to which I have remained faithful to the present day, which, however, has made me an outsider to the great majority of my colleagues. My work of observation and experimentation has absorbed my time and strength even more than is the case with most experimental psychologists.

Although I fully appreciate the saying of Aristotle that theory is the sweetest of all, I must confess that it was always a joy and a comfort to pass from theory to observation, from meditation to facts, from my writing-desk to the laboratory; and, thus, in the end, my writing-desk was neglected and has not produced a single textbook or compendium, which indeed ought to have been its first duty, even at the time when I was an instructor. However, I never intended to spend so much of my lifetime on acoustics and musical psychological studies as I did later on. I had counted on a few years. But it was, after all, not musical science but philosophy that always remained mistress of the house, who, it is true,

granted most generously great privileges to her helpmate.

In this gay Frankish city, however, one did not live only to work. There was a large circle of friends and plenty of fun, but to talk about such matters would be quite out of place here. Among the older men, Kohlrausch and Wislicenus were my most intimate friends; [p. 398] among the young scientists there was Erich Schmidt, who took my lectures on metaphysics, besides the buoyant archaeologist, Flasch, and the Romanist, Mall, a native of the Palatinate, who had absorbed the air of Berlin during the stirring sixties, a sort of Mephistophelian Merk, whose influence had a good deal to do with my withdrawal from Brentano's unconditional optimism. After five years I was thoroughly tired of a bachelor's life, and I realized that a certain attachment of the Göttingen period had taken deeper root than I had been ready to admit even to myself. Music, Beethoven's great wonderful Trio in B Major, had brought us together. Meanwhile, Miss Hermine Biedermann had taken a teaching position in Berlin. She followed the new call, and soon we were united for life. The great Trio in B Major, however, became our family trio.

In 1879 I received a call to Prague to succeed Volkmann. The faculty had thought at first of Otto Liebmann, but Brentano, who had been teaching in Vienna since 1874, had recommended me, without my knowledge, in order to gain in Austria a firmer hold for our theories. Under these circumstances I hesitated, but finally I accepted, partly because the strange romantic city on the Moldau appealed to my innate wanderlust, partly or indeed mainly because my influence in Würzburg, for local reasons, had greatly decreased during recent years. A philosopher who does not specialize in popular lectures can expect a large audience in Würzburg only if the students of theology attend his courses. This was the case during my first semester. But, as I in no way concealed my independent attitude toward the Church, the theological students gradually dropped my lectures almost entirely. A religious Protestant, like Külpe, is much more acceptable to the Catholic theological faculty than an heretical Catholic.

In the fall of 1879 my work in Prague commenced. The following year came Marty from Czernowitz, my best friend during my college days in Würzburg. The intercourse and professional cooperation with this man, remarkable for his keen mind and strength of character, whose studies in the philosophy of language led him deep into thought-psychology, was a great boon to me. It is, perhaps, not quite wise in assembling a faculty to maintain that the members of the philosophical department should hold different or even opposite views. If the point of view itself is not too one-sided, both students and teachers will gain decidedly by harmonious cooperation of like-minded leaders.

[p. 399] In Prague I had to give, every winter, a long course in practical philosophy -- obligatory for the law students -- which, so far, had concerned me very little. I at once worked out systematically and thoroughly a most comprehensive course, including philosophy of law and of the state. In this connection I picked up many loose threads of my brief experience as a law student, and became especially fascinated with problems of penal law. Later on, I gave, repeatedly, courses in practical philosophy and on the theory of voluntary action; the last time was in Berlin, in 1896.

The strenuous work of the first winter, together with family trouble and the unhygienic

conditions of the city, seriously affected my health. However, in the second year I was able to resume my work on tone psychology, although the necessary apparatus was almost entirely lacking. To the investigation of extremely unmusical subjects, commenced in Würzburg, I now added the study of the theories of music of antiquity and of the Middle Ages and also the study of the ethnological literature of music -- such as it was at that time.

In 1883 the first volume of my *Tonpsychologie* appeared, which, in spite of long preparation, was, just like the book on space, finished only after it had gone to press, and shows the effects of this procedure.

Among my colleagues, Marty, Mach, and Hering were professionally closest to me. I never became personally intimate with Mach, in spite of my high esteem for the man, whereas I have maintained friendly relations with Hering all my life. These two men were the leaders of German rationalism at the University. During the struggle for our nationality, which rose to great intensity under the Taaffe ministry, I myself became a good German and learned to hold the Bohemian Germans in high esteem as a serious industrious branch of our people steeled by centuries of fighting for their national existence.

The year 1882 brought to us our great joy, a visit from William James, who had liked my book on space, and with whom I soon found myself on terms of friendship. Later we met again in Munich and we kept up our correspondence to the end, though I could not follow him in his conversion to pragmatism. In his letters, published by his son, the genial, warm-hearted disposition of this brilliant man is particularly well revealed.

In the summer of 1884 I received a call to Halle to take Ulrich's place as a colleague of Haym and J. E. Erdmann. My longing for [p. 400] the German Fatherland had become so intense that I accepted the call with great rejoicing. In the quiet town of Halle I met G. Cantor, who was greatly interested in philosophy; and, since 1886, Husserl, recommended by Brentano, was first my student, later an instructor, and became intimately associated with me scientifically and as a friend; nothing here could interfere with my work, except the active social life, which I never could stand very well; but I made good progress with the second volume of the *Tonpsychologie*. That I had to make the fusion-experiments on the cathedral organ, instead of in a psychological institute, was no disadvantage, as there is no richer source of constant tone waves, of all possible shadings, than a good organ. On the other hand, I felt very keenly the lack of necessary apparatus, but I was able for the first time to make musical experiments with primitive subjects, i.e., on the Bellakula Indians and other tribes, who, through the efforts of Alfred Kirchhoff, honored the city with their visit.

In 1889 I was called to Munich as the successor of Prantl. Again I did not hesitate to accept, happy in the prospect to be nearer my old home; and in the fall of the same year I was settled in my beloved Munich. Here von Hertling, also a pupil of Brentano, was the exponent of Catholic philosophy. He was a loyal colleague, but on account of our diverging views we never became personally intimate. My dearest friend was the aesthetically minded philologist, Rudolph Schöll, who unfortunately died at an early age. For experimental psychology, and more especially for my acoustic studies, I could now gradually gather a collection of apparatus which was paid for from the faculty exchequer. This collection was kept partly in a closet in one of the corridors of the University, whence I took the instruments on Sundays to one of the lecture-rooms for observation and experiments, and partly in the upper story of the high tower, which still stands among the back-buildings of the University.

The assistant of the Physical Institute had bought, for a song, a tuning-fork piano, which might have dated from the times of Chladni; this he had taken apart, and he sold me the tuning-forks, a "continuous tone-series," with which I made many observations for the second volume of the *Tonpsychologie*. That is the way one had to manage in those days.

In Munich, as a member of the Academy, I wrote a number of academic treatises -- hack-writing, in a sense, as one had to choose [p. 401] one's subject with some regard to the space-limits, into which philosophical subjects are less easily fitted than themes of history, philology, or natural science. Many of the lectures I gave in Berlin remained in manuscript, but the customary condensed tables of contents in the assembly reports I have added to the index of my writings, since they can at least suggest my views on the various subjects to any one who might be interested.

My severe criticism of a piece of work emanating from the Leipzig Institute involved me in a discussion with Wundt, which he, on his part, spiced with the most scathing invectives.

That I was objectively right was proven by the fact that the results of the experiments in question -- supposed to upset Fechner's law -- were never and nowhere mentioned again, so far as I know, except in Wundt's textbook. However, I did not hesitate to express my opinion of the later acoustic work of the Leipzig school, nearly all of which I had to condemn; but I hope that I never overstepped the limits of objective criticism. Wundt's methods of procedure had been repellent to me even since his Heidelberg days, and continue to be so, although I admire his extraordinary breadth of vision and his literary productivity, even in his extreme old age.

I never imagined that I could leave Munich again, but, after five years, as in Prague and Halle, temptation approached me once more. Althoff tendered me an invitation to Berlin, where they wanted an experimental psychologist, when Zeller resigned, and Dilthey represented the historical approach. Although the call was a distinct honor, I had never felt any love for Berlin, and feared especially that there I should not be able to carry out my scientific life-work as I had planned it, so I declined. But, after a few weeks, I began to realize that Munich, after all, was not the right place to realize my ambitions. It was impossible to found an institute. I had appealed to the Minister of Education, who had always been most accommodating, for a yearly appropriation of five hundred marks for experimental psychology. His answer was that such a sum might be attainable, but that he would have to put the matter before the legislature, and there he might meet with the reproach that he was favoring materialism. Thereupon I declared that I should have to leave. Soon after this, however, Lipps was granted an endowed seminary, and later, Külpe a large institute. So the real reason for the Minister's attitude was probably quite a different matter, namely, [p. 402] my decided opposition to certain ecclesiastical wishes, shared by the court, in regard to the Academy.

Thus, at Easter of the year 1894, I went to Berlin, and now, after thirty years, I still believe that my decision was for the best. My fear that I might not be able to finish the *Tonpsychologie* and other greater works I had planned, unfortunately, proved well founded. But the psychological seminary, which started in three dark back rooms, developed into a large institute; and I have been able to pursue every kind of work, often fully, in every direction that interested me. Berlin's genius loci, the all-pervading spirit of work, had caught me. Inspirations came a-plenty, and there was no question, however remote, on which one could not find an expert opinion. Berlin was, moreover, musically the foremost city of the world, and Joachim, that noblest of performing artists whom I had known for some time as a friend, was still in his prime. All the great men with whom, during these many years, I came into closer touch officially, personally, and often socially, I cannot even name here.

But I do want to mention that fact that I was able to associate personally with Helmholtz for at least one semester, and with Mommsen, for a decade; to maintain most cordial and harmonious relations with Dilthey, Paulsen, and their successors; and to renew my old

friendship with Erich Schmidt and Kohlrausch. The personal intercourse among the colleagues of the University was kept up, in spite of long distances, not only by social life but also by the weekly faculty and academic meeting, and I considered it most fortunate that the large College of Arts and Sciences, in spite of its immense administrative burden, remained undivided. Through the many points of contact between psychology and modern thinking and living, I found that the great city harbored, besides men of sincere scientific interest and attitude, dangerous persons with questionable ambitions, who, under cover of art or science or even social welfare, pursued idle or commercial aims. This fact has often engendered disagreeable and time-consuming friction.

Since I feared not only the distraction from my own work, but also the danger of wholesale production for such a new scientific departure, it was my own wish that the experimental equipment and locality be started on a small scale. But soon the needs of the students required an extension which was now, of course, more difficult to obtain. In 1900 the seminar was turned into a much enlarged [p. 403] institute, but ever and again there were new requirements, requests, petitions. In 1920 we were given twenty-five rooms in the former imperial castle, whose management under the generally difficult circumstances caused me much trouble, until I was able to relegate it to younger hands. From this original institute there developed in the course of time four smaller establishments devoted to medicine, theory of music, and to military purposes; they are conducted by students. Much more active than I in the development of the equipment were my assistants, first Dr. Fr. Schumann, and, later, Dr. Rupp, the enthusiastic and expert constructor of apparatus.^[1]

These men also conducted the experimental courses, while I had charge of the theoretical meetings, in which we discussed psychological problems a propos of various recent treatises, and emphasized, in the spirit of Brentano, not only the need of psychological observation but also the necessity of logical thinking. I laid particular stress on these meetings because I regard the experimental method -- at least of the external sort -- by no means as the cure-all for psychology. For some time we were especially concerned with the theory of volition and questions of legal psychology, in the discussion of which certain men took part who later became prominent in the profession, such as Kantorowicz and Radbruch. This highly fertile field should be, I believe, investigated much more thoroughly by psychologists. The theory of volition was also the subject of several academic lectures, which were never published.

My studies in acoustics at Berlin, in which I was assisted, even during the first few years, by Abraham, Schaefer, Max Meyer, Pfungst, and later on by von Hornbostel, von Allesch, and many others, were initially of a purely physical nature, and were published in the *Annalen der Physik*. By testing musical sources for their overtones and by the production of absolutely simple tones by the interference method, we laid the foundation for all subsequent acoustic experiments at the Institute. These have been collected since 1898 in my *Beiträge*, of which the first volume, containing my *Konsonanztheorie*, had been intended for the nucleus of the third volume of the *Tonpsychologie*, but now had to be published by itself. Our acoustic equipment gradually reached a state of unusual [p. 404] completeness, but was suggested and developed entirely according to the requirements of the investigation; not a single piece served merely for demonstration.

In 1896 von Shrenck-Notzing and I took charge of the preparations for the Third International Congress of Psychology in Munich, also of its direction. The attendance from all countries was enormous, and the resulting correspondence consumed a large part of my time. As my theme for the inaugural address I chose the vital question of the relation between mind and body. I endeavored to prevent hypnotic and occult phenomena from occupying the foreground, as had been the case in former sessions. The related

departments were likewise represented by prominent investigators, as Hering, Flechsig, von Liszt, Pierre Janet, Richet, Forel, Flournoy, and Sidgwick. There was many a sharp conflict and spirited encounter, and, without doubt, much that was interesting and stimulating. Nevertheless, there has been no subsequent International Congress of Psychology in Germany since then, and it was considered more advantageous to discuss such moot questions in the domestic circle of the *Deutsche Gesellschaft für experimentelle Psychologie*, where foreigners also could take part.

With some phonographic records of a Siamese company performing in Berlin, I started, in 1900, the Archive for Phonograms, which was further developed by Abraham and von Hornbostel and later on conducted entirely by the latter.

At this time the work founded by Spitta, *Denkmäler deutscher Tonkunst*, and discontinued after his death in 1894, was reorganized by R. von Liliencron. I had been a member of the Commission since my coming to Berlin, and now, at the urgent request of Liliencron and Althoff, I consented to substitute for the deaf, eighty-year-old president, and kept his place until he died in 1912. The friendship with the venerable scholar, a nobleman in the true sense of the word, was a great privilege. For the rest, I thought of Mommsen's saying that in every commission there should be one member who knows nothing about the matter in question. Still, the merely formal direction of the discussions I could assume with an easy conscience and could increase, thereby, my knowledge of the old masters in a most desirable manner.

The same year I started, together with the principal, Dr. Kemsies, the Berlin *Gesellschaft für Kinderpsychologie*. By means of this [p. 405] organization I hoped to induce the teachers, especially of the intermediate schools, and also medical circles and educated parents, to take an active part in psychological studies and observations of the mental life of the child. I myself had repeatedly found these valuable in tone psychology, and I had kept a careful record of my own children. For several years this enterprise was very successful; during this time, among medical men especially, the famous child specialist, Dr. Heubner, took an active part. Two lectures of mine, later included in the collected lectures, were suggested by this work; the one concerning the peculiar speech development of a child has been especially noticed in the literature. It appeared, gradually, that the teachers were kept away by the pressing duties of their profession, perhaps partly, also, by their suspicions against the reform-threatening psychology. At that very time the work of applied psychology and school reform came so forcibly to the front that there was no room left for a society with pronounced theoretical aims. Other duties forced me to give up the leadership, and during the War the society quietly passed away.

Frequently I have had the opportunity to study prodigies. Thus, in the year 1897, the nerve specialist, Placzek, led me to examine a boy of four years, who had a most remarkable memory. Since his second year, he had been exhibited in scientific societies of different countries, even at the Berlin Panoptikum. As a consequence of my detailed report in the *Vossische Zeitung*, a prominent newspaper with the financial aid of some rich patrons, a governess was engaged to help the child through the most difficult years. In school the miraculous abnormality, being incompatible with a normal development, gradually wore off. Now he has become, to my great satisfaction, an efficient school principal. In 1903 I studied the early signs of musical talent in the child prodigy, Pepito Arriola, whom Richet had already exhibited at the Paris Congress. He became a noted pianist during his sojourn in America, but not a great composer, as Arthur Nikisch and I had hoped,

from his achievements as a child. Among many others I also examined the young Hungarian, Hyiregyházy, about whom Révész wrote a whole book.

Such pedagogical-didactic applications of psychology, arising in connection with child psychology and memory experiments, gave birth, at the beginning of this century, to applied psychology. In the Psychological Institute, Professor Rupp devoted himself to this new [p. 406] branch and now has a whole division set apart for it. I, personally, was not interested, but I aided its bold endeavors whenever the necessary precaution in execution was not overlooked.

In 1903 my interest was aroused by Krueger's investigations of combination tones on which he founded a new consonance theory, and I undertook an experimental investigation of this field, which, with some lengthy interruptions, kept me busy until 1909. That I should spend so much time and effort on a comparatively small and unimportant field of phenomena, to which I attribute a physiological rather than a psychological significance, might cause some surprise; but whoever reads the treatise will admit that here some questions of methodological principles had to be settled and that there were many special questions of fact which could be answered by the newly developed processes. Still, it is true here, as elsewhere, that if I had known beforehand how long this work would take, I should never have undertaken it.

The year 1903 brought a diversion towards which, for the sake of concentration, I ought to have been less susceptible. The engineer Cervenka of Prague had been induced by two Berlin investigators to demonstrate in the assembly hall of the University an alleged highly important phonographic invention, and the most distinguished personages as well as the entire faculty were invited. It was claimed that photographs of sound waves had been changed back into sound. We of the Psychological Institute, as well as the representatives of the gramophone company, suspected that here on hallowed ground a bold deception had been perpetrated. I wrote a challenging, sarcastic article, and followed it up with a second one in collaboration with the physiologist, Engelmann. The work of exposure was made very difficult for us; but, finally, we produced conclusive proofs, and, thereafter, not a single word of the great invention was ever heard again. The affair had, however, some positive results. One was a revolution and a complete reorganization of the International Musical Society.

Shortly thereafter I was involved in another affair, more directly concerning psychology; it was the case of "clever Hans." In 1904, having just returned from a celebration of Kant's anniversary in Königsberg, after the lecture I was requested by a member of the Board of Education, to which Mr. von Osten had appealed, to investigate the matter, since the Board did not know just what attitude [p. 407] to assume in regard to the affair. That this was not a case of intentional deception was evident from the fact that the horse responded to the well-known African explorer, Mr. Schillings, just the same as to Mr. von Osten.

Therefore an investigation seemed not out of place. I fully realized the extraordinary difficulties involved; the excitement aroused in the city and even in foreign countries by the daily reports of the strange case in the newspapers; the curiosity of the crowds which sought admission; the peculiarities of Mr. von Osten; the unfavorable locality; etc. The irresistible desire to determine the facts induced me to undertake the investigation, and we finally succeeded in revealing the facts, mainly by virtue of the keen eyes and iron patience of my assistant, Pfungst. In this case there were many interesting, more general results. Unintentionally, Mr. von Osten had confirmed by an experiment in a grand style Aristotle's theory of the absence of abstract reasoning in animals. For, if a method so carefully planned pedagogically as that which this former teacher of mathematics had used with

untiring patience on his horse effects only the recognition of an unconscious movement of the head, then such failure must be due to the incapacity of the pupil. This solution, it is true, was not accepted everywhere. There appeared the horses from Elberfeld and the dog from Mannheim, with which professors of zoölogy and psychiatry actually entered into correspondence. In the *Journal of Animal Psychology* these men are still defending the presence of higher thought processes in animals. I had no desire for further investigation of such cases. Later, when the Academy of Sciences was enabled by the Sampson bequest to found on Teneriffe a station for anthropoids, where, at the suggestion of Professor Rothmann, anthropoid apes, coming directly from the jungles of our colonies, were to be studied systematically, I suggested Dr. Köhler for this investigation, and we all know how successful he was. Köhler did not attempt biologically useless stunts of calculation; his experiments were concerned with the important life-activities of the animals, and he proved that his chimpanzees in their use of tools and detours went far beyond the assumed limits of animal intelligence, and showed, in a certain sense, an "intelligent" behavior; only empirically intelligent, of course, not presupposing any general concepts, as arithmetic does.

In 1905 I was invited by the Kaiser Wilhelm Akademie für Militärärzte (Pepinière) to give short annual lecture courses on [p. 408] whatever philosophical topics I chose, and I gladly seized this opportunity to interest the medical youth in philosophy and its history. It must have been about this time that the assistance of the Physiological Institute, together with those of the Psychological Institute and myself, founded the "Hirnrinde" to discuss common problems in a similar manner as had once upon a time been done in the old Göttingen "Eskimo." Soon some of the medical students joined us, among them Hugo Liepmann, who was chosen president. This society still exists and has proved very much worth while.

I was Rector of the University in 1907-1908. In my inaugural speech I expressed my conception of the present-day position of philosophy and its aims and problems. The position brought many interesting experiences, such as meeting the leading personalities of all circles; representing the University at scientific congresses; a conversation of forty-five minutes' length with the Emperor during my official call, when he did almost all the talking and expressed himself with astounding frankness. My daily occupation with curricular problems and students' affairs brought me great satisfaction, and, in the second semester, some unexpected excitement, through the struggle with the *Freie Studentenschaft*, which so far had always enjoyed my special favor. This union did not by any means include the entire number of non-incorporated students (*Finkenschaft*), but only a relatively small group who had assumed the right to fight for the interests and cultural aims of all non-incorporated students. But again and again they confused the representation of the *Finkenschaft* itself, and the small group of second- or third-semester students, or at least its self-appointed leaders, made demands which amounted to a co-regency. So the combat was on. There were vast general students' assemblies, in which radical politicians of the left wing, such as Breitscheid and von Gerlach, increased the excitement. They spoke of the murderer of academic liberty, of the rule of the Russian knout. I dissolved the *Freie Studentenschaft*, and with this discord the year ended. The Senate had always supported me. In the following semester the Board of Education permitted the reorganization of the student body with entirely new rulings to avoid the above-mentioned confusion. During the following years, a general student board was appointed, which constituted a real representation of the student body, while the *Freie Studentenschaft* continued their otherwise most laudable work. It [p. 409] is possible that a too strict insistence on minor points, which I might have overlooked, intensified the struggle which, however, had also burst forth elsewhere (Marburg, Halle). But sooner or later it had to be settled. That it fell to my lot I deeply regretted, for I loved the students, and the affair marred that otherwise splendid year. In the warning words of my second lecture as a Rector (on ethical skepticism) the echo of that episode mingles with a premonition of the trying time that was about to beset our Fatherland and was already predictable from unmistakable symptoms.

In 1909 the Berlin Philosophical Seminar, toward which Riehl and I had been working for some time, was established and splendidly organized by Erdmann. I belonged nominally to the directors but could take part only as advisor, and once by holding a seminar on Aristotle's metaphysics. I should have liked to establish here, too, a connection between psychology and philosophy, but the Institute did not permit of this. Occasionally Kant and Hume furnished the texts for philosophical seminars.

A pleasant interruption of the summer semester of 1909 was the request to represent the University at the Darwin anniversary in Cambridge. I had witnessed the rise and fall of Darwinism in its original form, but the idea of evolution had been bred in my very bones -- as was the case with all my contemporaries; moreover, I felt such a profound admiration for the personality of this great investigator that I felt justified in accepting the mission. In my address, which was printed in the *Jahreschronik* of the University, I have expressed that admiration.

At the anniversary of the University of Berlin in 1910 the title of Doctor honoris was bestowed on me, and I gratefully appreciated this recognition of my efforts to establish a closer relationship between philosophy, psychology, and medicine. It was much less enjoyable that, in the course of time, I was forced to realize this relation as a patient and experimental subject by three dangerous abscesses of the ear, with two trepanations of the right temporal bone -- and twice also as *casus rarissimus* of ophthalmology. But my ear passed its rigorous test *magna cum laude*; each time it completely recovered its hearing, and I could continue my investigations on vowels which I had started just before the last operation. My eye, unfortunately, just barely passed.

In 1914, at the Sixth Congress of Experimental Psychology, I [p. 410] reported the recent experiments on the theory of tone. On this occasion I offered a critical discussion of the radical vowel investigations by W. Köhler of the Berlin Institute, which had first been reported at the Fourth Congress in 1910. This led me to study the nature of vowels and of sounds of speech, in general, more thoroughly than had been done in the last paragraphs of the *Tonpsychologie*. The experimental results fascinated me to such an extent that I could not give up the investigation until this important field of phenomenology had been satisfactorily cleared up. Since the Institute was almost deserted during the first years of the War, I took advantage of the stillness of my surroundings for the most intense effort of the sense of hearing for my tone analyses. On the other hand, there were, of course, great difficulties and delays in the construction or repairing of apparatus. Furthermore, during the last years of the War the Institute was used by younger men for experiments in military psychotechnique (apparatus for measuring sound, etc.), and, naturally, my peaceful researches had to give way. Consequently they were not finished until about 1918.

During the War a call for collaboration went to the experimental psychologists of all the great countries involved in the struggle. As a representative of psychology in the Capitol, I took part in the national organization of this work. We did not attain, however, such a comprehensive and systematic cooperation as was attained in America.

In another enterprise eminently peaceful, although likewise suggested by the War, we have without doubt surpassed other nations. In 1915, at the suggestion of the school principal, Doegen, a large number of philologists, together with me, a musical scholar, undertook to make phonographic records of the native dialects, songs, and other musical productions of the prisoners-of-war, who were gathering from all corners of the earth, often from unknown and inaccessible regions. The Minister of Education appointed a commission of specialists drawn from all parts of Germany, who took technically excellent records in thirty-two prison camps, at the same time collecting the necessary material for the scientific study and classification of the records. Besides the grammophone records of the Commission, the Phonogram Archive had Dr. Schünemann make a large number of records with the more convenient Edison machine. The direction of the Commission was entrusted to me and took much [p. 411] time, consuming even my lecture time for a whole semester. But it meant much to me to observe, personally, the delivery and general bearing of these exotic singers, which certainly supplemented and enlivened my impression of the records. After the revolution, this entire collection was taken from the Commission without even a word of thanks and turned over to the State Library, where, in my opinion, no adequate provision has been made for its scientific upkeep.

Our old Phonogram Archive, which we had been collecting for twenty years and which consisted of about 10,000 records of inestimable value since those primitive tribes may die out or become civilized, were not taken over by the state at that time, and therefore were left without financial backing. After the state's attorneys discovered that ownership of the collection -- to which we had really never given any thought -- was vested in Mr. von Hornbostel and me, we put it at the disposal of the state with the understanding that the latter would attend to the upkeep and continuation of the collection. This condition was granted, and in 1923 the collection was turned over to the *Hochschule für Musik*. Unfortunately, on account of the general financial depression, which naturally affects, first of all, matters not pertaining to everyday life, the state cannot at present provide adequately for this purpose, so that our worries are by no means disposed of. It is some satisfaction, however, that, in spite of unfavorable times, we were able to found the *Sammelbände für vergleichende Musikwissenschaft* and thus have an opportunity to publish any articles in this line; and, furthermore, that the appointment of Messrs. Schünemann, Sachs, and von Hornbostel at Berlin makes this city by far the best place to carry on researches in that field.

At Easter, 1921, my official activity at the University was ended, on account of the new regulations concerning the age limit; but I continued my lectures until the summer of 1923. In Berlin, where the different branches of philosophy are represented by a large number of younger instructors, my lectures did not include general philosophy, but were confined practically to psychology, history of philosophy, and logic; in more recent years I have repeatedly given a course entitled *Weltanschauungsfragen*, in which I presented, as it were, a philosophical system. My lectures have taken much of my time until just a few years ago, since each semester certain especially unsatisfactory parts had to be recast. I was anxious to give a general [p. 412] view of the subject, to trace the history of philosophy up to the present time, but also to illustrate principles of scientific method by certain detailed expositions. I was not over-fond of lecturing, and often found it even an irksome task, interfering with the scientific research which was my chief concern and of course always led me more deeply into the subject-matter than the lectures -- often, indeed, because of my special interests, along quite different lines of work. I have never, for instance, lectured on tone psychology or topics of musical research. Still, I recognized the marked advantage of combining teaching with scientific research for the very reason that it keeps in view the subject as a whole as

well as in detail.

Since I had learned stenography in high school, I used to draw upon all sorts of shorthand memoranda in preparing my lectures. Only in recent years have my eyes forced me to dispense entirely with notes, and I must confess that consequently I take much more pleasure in my lectures, just because they are not literally "lectures" ("readings"), but speeches. I seem to be in closer and more vivid contact with my hearers. There is one disadvantage in using notes; by constant writing, one forms the habit of doing one's thinking while writing, and thus loses the art of speaking extemporaneously; still, the advantages are so great, especially for collecting material, making excerpts, and registering observations and experiments with all details, that, in general, I recommend it most warmly.

About 1907 I had resigned from the *Prüfungskommission für Oberlehrer* because the abominable preparation of the candidates, who were absorbed in their major subjects, disgusted me, and because the system of keeping records, especially of the pedagogy examinations, as it was practiced at Berlin, consumed too much time. The university examinations, too, at Berlin are a considerable burden on the faculty, for, in addition to every major subject in the arts and sciences, philosophy is required as a minor. But here the results were more satisfactory. It was my habit not to confine my questions to a single theme but rather to probe here and there until I struck bottom. Often I found that the candidate had developed a real interest in philosophy, not merely in the examination.

I belonged to the committee of the Academy for editing the works of Kant and Leibniz, and, after the death of Dilthey and later Erdmann, I had to direct the work temporarily.

I considered it lucky that during these years Kant's correspondence was finished -- [p. 413] the end of the long labor of editing his works -- and an effective start was made on Leibniz' works, which became possible quite contrary to our expectations. In the preface I recalled the enthusiastic words of Boutroux, the former director of the French Leibniz Commission, which stand in sharp contrast to the present exclusion of Germany from international scientific enterprises, and I expressed the hope that the spirit of Leibniz would sometime come again into its own. It gave me great pleasure that at the end I had to mention also my little native town of Wisentheid, where interesting Leibniz documents had been found in the ducal Schöborn archives.

I cannot close this sketch of my life without mentioning that in 1921 I severed my connection with the Catholic Church. Although estranged for over fifty years, I had never formally withdrawn, being too well aware of the blessings our Church bestowed, nor had I any inclination to exchange my old confession of faith for any other. But the behavior of the officiating priest at the funeral of one of my brothers (he considered it necessary to apologize for standing at this grave, because the deceased, whose noble human qualities he later on felt constrained to praise duly, had not lived up to the regulations of the Church) induced me to take the decisive step. Though I am now non-denominational, as it were, I still confess myself with all my heart a disciple of Christianity as the religion of love and mercy -- which needs no revaluation, but rather a higher appreciation -- and I hope that in some time to come the different denominations will meet in this spirit, if not for a complete reunion, at least for a closer approach, a reconciliation.

II. Views and Researches

The following part of this paper has two aims: in the first place, to elucidate the purpose, methods, and results of my printed works, and, at the same time, to fill out, to supplement them, by connecting passages, so that the reader may find not disconnected fragments, but an integral whole through which the component parts, in turn, may be discerned and understood. If my presentation should seem dogmatic or even superficial, I hope that the reader will realize that this is not my usual procedure, and furthermore will find more detailed proofs in my writings.

First of all, let me say that the general tenor of all my views reflects the initial inspiration received from Brentano. To mention [p. 414] all points of agreement and dissent would take us too far afield. But it may be noted that the agreements pertain more often to earlier than to the later form of his teaching.

Überweg (Austria) says, in the paragraph referring to Husserl, that I had started with Brentano, but later showed a closer approach to Husserl. That sounds as if Husserl's influence had changed my point of view in certain respects. This is, however, not the case. My deviations from Brentano's theories were the result of an internal, constant mental development. The pupils of Brentano naturally have many things in common in consequence of the same starting-point; many others, however, because of the necessity of changes, additions, and continuations simultaneously felt by those who proceed in the same direction.

1) *Definition of Philosophy.* However one may formulate the difference between mind and nature, everybody distinguished them in some manner. The philosopher, however, looks for what they have in common. Thus philosophy is primarily the science of things in general, or metaphysics, to which the gateway is epistemology. But that philosophers since olden times have generally regarded psychology as belonging to their proper field is due to the fact that psychic elements have been much more prominent than the physical in forming fundamental metaphysical conceptions. Therefore, it is to the point to define philosophy as the science of the most common laws of the psychical, and of the real, in general (or conversely). This is the only way in which we can justify the inclusion of logic, ethics, aesthetics, philosophy of law, pedagogy, and other branches in the domain of the philosophical sciences; the connecting link is always essentially psychology, which, therefore, must not forget -- absorbed in experimental detail -- the nobler phenomena of mental life which cannot be investigated in this manner and the great general questions.

2) *History of Philosophy.* Brentano's system of the four phases in which, so far, each of the three periods of philosophy since Thales has taken its course -- a growing phase, wherein theoretical interests and empirical methods predominate, a decline caused by the smothering influence of some popular philosophy of life, followed by a skeptical and, finally, a mystical reaction -- has always seemed to me a good key to the understanding of the development of philosophy, at least for antiquity and for modern times. In the Middle Ages the course [p. 415] was greatly modified by the influence of the Church and the authorized faith. Historical similarities or analogies are not laws of nature. Of course, the scheme cannot be applied blindly to all details (where would sophistry come in, for instance?), and

"decline" does not mean that during such stages profound, ingenious, and important achievements were entirely lacking. Finally, we must not forget that classifications from many other points of view are possible, although I consider the methodological the most important.

My first effect was devoted to the history of philosophy: my treatise on Plato's Idea of the Good and his conception of God. I tried to eliminate the contradiction between that philosopher's personal religious attitude and his philosophical system which Zeller had maintained by re-establishing Aristotle's conception of ideas as entities intrinsically different from concrete objects, and at the same time proving the identity of God with the Idea of the Good. This latter theory, which, incidentally, is shared by Zeller, is generally admitted today; concerning the right conception of Ideas the strife continues. I still consider the realistic conception correct, and Gomperz, Winderband, and Apelt agree with me, while transcendental evanescence seems ingenious, but unhistorical. My presentation, it is true, assumed too much of a closed system, and paid too little attention to the changes conditioned through Plato's course of development, especially the deviations in his last works for which philological methods have now given us a more complete understanding.

Among my later works, the two concerning the ancient theory of music (1897) contain many detailed discussions of passages in the text which have some importance for the history of philosophy, but have apparently not been noticed by my colleagues,

Two decades later, after much experimental work, I wrote a treatise on Spinoza, not because of any special sympathy with his philosophizing, but rather because I thought that I might say something new concerning one of his main points, the parallelism of the attributes. I believe I have demonstrated that his theory, both in form and in thought, is fundamentally different from modern psychophysical parallelism and is only an outflow of the old Aristotelian-scholastic theory of the parallelism of acts and contents of consciousness.

The second study discusses the infinite number of the attributes and endeavors to elucidate the terse suggestions of the philosopher [p. 416] and to carry them out, hypothetically at least, on the basis of the theory of parallelism; and to explain how the author, in spite of the vast number of objective attributes which constitute substance, could maintain their unity. A third study was to discuss the "geometrical method," and find for the first propositions of the Ethics, and their proofs which Leibnitz justly condemned, the unconscious assumptions which made them seem formally necessary to Spinoza himself.

Criticism so far has approached too much from the outside. The tasks of interpreting most clearly Spinoza's extreme conceptualistic realism and at the same time his dependence on scholasticism we recommend to those who delight in logical studies.

The greatest methodological [*sic*] achievement in philosophy since Descartes I find not in Kant or Hegel, but (with Brentano) rather in Locke and Leibnitz, and to these I would add Berkeley. Even though phenomenalism and the polemics against general conceptions really rest upon a misunderstanding, still we find mistakes of this kind even in the greatest thinkers; Berkeley's clear and precise presentation, however, and the energy of his thinking place him even above Locke, who excels him only in versatility. That Leibnitz far excels his predecessors no one will deny today. Among the immediate predecessors of Kant's *Kritik* I was especially fascinated by Tetens, whose *Philosophische Versuche* quite justly has been called the German counterpart of Locke's *Essay*. During my sojourn in Halle I suggested to Schlegtendahl and Störring their analysis of this work, and later I myself devoted a treatise to his theory of relations (*Psychol. u. Erkenntnistheorie*, Anhang 2). The spirit of

unprejudiced and thorough research has probably never been so vitally effective in any other German philosopher before Lotze.

Kant's intellectual and ethical greatness is revealed above all in his re-establishing in full force the idea of necessity and its complement, the conception of duty. But, while he is still caught by one foot in the hypercriticism, he is already standing with the other in the speculative dogmatism of the subsequent period. Both tendencies, but especially the latter with its constructive mania, I cannot possibly consider worthy of imitation as the ideal form of philosophizing. Kant and the critical philosophy I have discussed repeatedly, and the post-Kantians have been taken up in my treatise *Wiedergeburt der Philosophie*. But whether we are already generally and definitely in a period of ascendancy, I am inclined to [p. 417] doubt, as did Brentano in his last years. The numerous and varied beginnings, none of which rests upon each other, bear little resemblance to the systematic progress of true science. Even in psychology the disintegration has assumed dangerous forms; but here one may find some comfort, at least, in the Heraklitean dictum that struggle is the father of all things, since, after all, the foundation of established facts is steadily expanding.

The *Tafeln zur Geschichte der Philosophie* -- with the third edition of which Menzer assisted -- were designed for teaching purposes rather than as aids to historical research. They originated in Munich, when Prince Friedrich Karl of Hessa attended my lectures on logic, and I instructed him in the history of philosophy during our walks in the English garden. The scheme of lines, etc., pleased my colleagues none too well; but let it not be forgotten that it was designed for beginners.

3) *Epistemology and Logic*. These two disciplines are distinguished by the fact that epistemology pertains to the theoretical, and logic to the practical, the directions for testing and discovering the cognitions. Psychology, which treats of the processes of thinking and knowing, as such, besides other processes, is not basic for either of the two, but at the same time neither of them can dispense with it. By Kant's fundamental theses I demonstrated how the neglect of psychology always tells, but condemned also the psychologistic attempt to deduce the criteria of truth from the mechanism of psychic functions.

a) *The origin of fundamental concepts (categories)*. To consider these as a priori would mean simply to cut the Gordian knot. We must try again and again to discover the original phenomena which form the foundation of their perception. Thus in regard to the thing-concept, or notion of substance, we may point out that in certain apperceptions we actually and directly perceive the close interpenetration of parts of a whole. Even in every sensory feeling the "attributes," quality, intensity, extension, etc., form not a sum, but a whole, the parts of which, in fact, are only subsequent abstractions. In the realm of psychic functions, intellectual and emotional functions, and indeed all simultaneous states of consciousness, are intimately connected (unity of consciousness) and are directly perceived as a unity. Hume's principle of research was, therefore, not incorrect, but he did not observe carefully enough, or [p. 418] he could not have defined substance as a bundle, but as a unity of qualities or conditions.

With the notion of cause he also stopped too soon. There are actually occurrences in

which we can perceive not only a sequence but an inner nexus. Whoever follows closely a train of thought is in a certain fundamental mood (interest) which is causal, and we are aware of it as such; it conditions the retention of ideas and everything connected with these, their comparison, combination, etc. The fact is not that we become interested in something and that *then*, after our interest has passed, its effects appear, just as in nature effect follows cause; here we are dealing with an immanent and permanent causality, which is observable in itself. In the case of natural phenomena the idea of cause is merely a matter of transference, and this, although unavoidable, is of no use to the investigator who is interested only in the strictly lawful sequence of events.

The conception of necessity or lawfulness^{[2]^[1]} may be conceived in its full force by realizing the content (expressed fact) of a priori, self-evident judgments like logical axioms and purely deductive propositions^{[3]^[2]}. This conception, again, is transferred to nature.

Of course the conception of truth is also rooted in the realm of judgment. That is true which is convincing to us, either directly or indirectly; and that is false the opposite of which convinces us, either directly or indirectly. One can also say that truth (or untruth) is that quality of the contents of consciousness by virtue of which they compel appreciation (or aversion) by purely objective standards. Here everything depends on the conception of self-evidence, which one might fairly call the fundamental conception of Brentano. Just what this means we must experience through such self-evident judgments as $2 \times 2 = 4$; it cannot be further reduced or defined. Self-evidence and truth are correlative conceptions; the former is, so to speak, the subjective aspect of truth, whereas truth itself is something objective, i.e., independent of the individual act of consciousness, a function of that which is conceived, not of the conceiving subject. All positivistic theories of truth, pragmatism not [p. 419] excepted, move in a circle. Only as maxims of thought, economy, and usefulness are they still to be encouraged.

Actuality or reality means effectiveness. Therefore, the conditions of our own mind are first of all given to us as real. For here, as I said above, we have a direct experience of causality. If we were not internally active, we should have no consciousness of reality. In the second place, we recognize as real "outside" objects (psychic as well as physical) in so far as we observe their effect on us. Whoever calls divinity the "most real being" conceives it simultaneously as the original cause. General laws, on the other hand, are true but not real because they are not effective.

b) The means of knowledge. We recognize a priori, by pure reason, laws deduced from bare concept and from self-evident propositions. Such insight involves no determinations of fact, wherefore it is most fittingly expressed in hypothetical propositions. In the case of mathematics, which is immediately relevant here, the a priori character of its truths is to be maintained even at the present time. If there are three geometries, each according to some assumed curvature of space (viz., of spacial forms), then each one is a priori, in its own right, and only its applicability to objective space is a matter of experience.

A priori cognitions issue not only from mathematical notions, but from any conception whatever, and such cognitions may add to our knowledge. The mere conception of two tones includes their conditions as to pitch, strength, time, duration, etc., which may be asserted of

this or of any other similar pair of tones. The mere conception of three tones of different pitch implies a definite relational order according to which one must be placed between the other two. The conception of a tone series arranged according to pitch contains the possibility of its continuation *ad infinitum*, which obviously cannot be proved by experience (see *Tonpsychologie*).

Such propositions, however, are not strictly synthetic, since they are understood not only by means of our concepts but about them, if the relations (conditions) are counted as part of the subject-matter. At any rate, we must ask how such analytical judgments as extensions of knowledge are possible. To answer this question, we need to find, among other data, the simplest and most general directly perceptible relations for this process and a theory of their apprehension. We have the beginning of such a general theory of relations, but it is still in need of verification and elaboration. The [p. 420] a priori judgments themselves cannot thereby become more convincing, but their epistemological structure and significance may become more comprehensible.

Facts as well as laws are recognized (experienced) a posteriori. The instantaneously given sensory contents and our own psychic functions are directly experienced, whereas their implications are experienced indirectly. The conclusions concerning an outside world independent from consciousness, and concerning the laws controlling it, have the form of probable inductions. The only way in which we can subordinate the phenomena of the mind to definite laws, such as warrant predictions, is by assuming an outside world, strictly subordinate to causal law, in which our bodies with their sensory and motor organs and other more or less similar psychophysical substances exist as parts of the whole. In place of this vast hypothesis, which includes an assumption of the validity of the causal law^{[4]4}, there seem to be two other possibilities: first, to assume single cosmic power (Berkeley), and, secondly, to posit an unconscious "productive power of imagination" within us (Fichte). But if one attempts seriously to develop these theories, they merge into that of the outer world. For, in order to derive explanations and predictions, one must attribute to the supposed agent as many parts as elementary particles of matter one has to assume for the other theory, and must also suppose the same laws to hold among these parts.

For the naïve, unscientific consciousness, of course, the belief in the outside world is no hypothesis and no product of reflection, but is connected instinctively with the sensuous phenomena. But *that* outside world is immeasurably different from the scientific universe.

The enormous significance of mathematical probability for the formation of hypotheses, which differs from the "philosophical" only in degree, was also recognized and emphasized by Brentano. But, since it has been repeatedly claimed that application of the conception of probability already includes presuppositions concerning the outside world and the laws of causality, I have devoted a special monograph to this question, and believe I have demonstrated that this is not the case. So-called probability a posteriori, too, as it results from the [p. 421] law of large numbers, does not include any such presupposition, and it is superfluous to look for a physical mechanism which forces events to yield to this law. The principle of objective "leeways," as von Kries employs it, taken in a wide sense (i.e., as including not merely spacial or temporal but also logical leeways, or disjunctions) seems to me to lead to the same conception. The calculation of probability is, therefore, purely a priori, deduced from the mere concept of probability. In logic it has not as yet been duly recognized. It is indispensable in the development of a comprehensible theory of

induction. At the same time, the absolute impossibility of popular empiricism becomes apparent; for according to this view every inductive conclusion is based not only on facts but also on an a priori foundation. We can, therefore, agree with Kant not only in maintaining the conception of absolute necessity but also in assuming that nature is a product of the intellect, though indeed not quite in the sense or according to the principles of the *Kritik der Urteilskraft*.

The laws derived from experience are not, however, exclusively causal laws. We must also distinguish empirical laws of structure or substance. In both cases we have abbreviated procedures in which major terms are assumed as sufficiently well established. In the former case we thus assume the general law of causality, in the latter, such regularities as chemistry, for instance, has established with regard to the co-existence of certain properties.

Concerning my own attitude toward some of the principles of logic, I will say the following: I have always maintained Brentano's sharp distinction of judgment from mere conception, but the treatment of all judgments or assertions as existential judgments and the consequent revolution of the syllogistic theory I did not accept, later on, mainly because I, like Meinong, could not conceive of universal affirmative judgments as negations.

The conception of *Schverhalte*, the "state of affairs," which is being more and more widely used (Selz, Külpe, and others), was introduced by Brentano, who was fully aware of its import. I have merely replaced his term, "content of judgment," by that which is current at present, and which, in fact, I used for the first time in my lecture on logic in Halle in 1888.

To the significance of fictions for scientific research I have always devoted a special paragraph in my logic, but have never treated them as more than a sort of scaffolding which is removed after use.

The old question of the most fitting division of the sciences I have [p. 422] discussed in a special article, not on account of unimportant points of form, but because of relevant factual researches in epistemology. I was especially eager to re-establish the old distinction between natural science and mental science, which is based on differences of subject-matter. I am pleased to find Becher, in his exhaustive work, siding with me.

c) *Philosophy of nature*. The admirable development of physics and chemistry, which form the most general foundations of our conceptions of nature, has always followed the above-mentioned course. Sensory phenomena always were and still are their starting-points, but their subject-matter has become more and more the objective world. They approach it by way of hypotheses which most daringly draw even the objective nature of space and time into its domain. That these cannot be really as they seem to us, even the most obvious analysis reveals. Space I should define as that property of the concrete world which enables us to take measurements of a geometric type, and time as that which allows of change and of the commensurability of changes. It must be admitted that change itself cannot be defined without time; the two concepts simply are correlative. The concept of objective time contains no notion of past, present, or future. This is a noteworthy fact which enables us to treat

time as a fourth dimension of space in mathematical physics; this treatment, in my opinion, is simply a mathematical device in which the special character of time in relation to the other three dimensions finds expression in the formula itself.

We need not elaborate upon the fact that the transition from the mechanical to the electromagnetic conception of nature falls within the methodological domain we have outlined. The hypothesis of an external world has not suffered any restriction of its explanatory powers. Any assumption is physically useable if it is free from contradiction and allows of quantitative predictions by which it can be tested. The common-sense conception of spatial movements is the most obvious one to attempt, but it holds no specially privileged position.

The transition from action at a distance to contiguous causation, however, was epistemologically inescapable. I do not know how physical causality could be unambiguously expressed, except as follows: "If, between two contiguous substances, there exist definite combinations of conditions, then in both occurs a change in which [p. 423] the new conditions on each side are connected with the old ones on the other side, and every change depends upon the occurrence of such combinations of conditions." (This formula is easily expanded so as to apply also to psychophysical interaction.) This means that all action is really interaction, but also that there is no direct interaction of everything with everything, but that only contiguous substances can interact with each other. Thus atoms or electrons, without which physics and chemistry are unthinkable at present, cannot affect one another in empty space, but only through the mediation of some ether, which I consider, therefore, an indispensable postulate of atomism.

The introduction, of the notion of Gestalt into physics, such as W. Köhler demands in his ingenious book on physical forms, seems to meet with certain difficulties from this point of view, for the law of interaction will always compel the physicist to pursue the course of an effect from particle to particle, whereas the psychologist in describing the facts of consciousness may emphasize the priority of the whole over the parts.

The difference between the living and the non-living seems to me to lie in the immensely complicated structure of even the simplest organisms, or germs. The complicated mechanical conditions under which the physico-chemical forces work, if properly analyzed, will probably suffice to explain (except perhaps for certain psychical reactions) the processes of nutrition and reproduction. Science cannot admit the existence of forces which act now in a certain way, and now in another, perhaps the very opposite, as it was assumed formerly with the old *Life Force*, von Hartmann's *Unconsciousness*, and Pauly's psychovitalistic factors. Neither do terms like entelechy or dominants tend to improve matters. On the other hand, it seems not impossible, but in fact quite plausible, that the well-known conscious psychic conditions such as pleasure and pain, emotions, and volitions act as stimuli for nervous processes. Psychovitalism in this empirically controllable form would probably have been admitted even by Lotze, who was the keenest opponent of the old *Life Force*. E. Becher's interesting evolutionary "principle of exploitation," for instance, probably rests on some such foundation.

The philosopher, however, is more interested in the still more general problem of teleology

than in vitalism. The innumerable intricately arranged particles, which even a unicellular creature presents (its environment must also be considered, since organisms without [p. 424] a definite inorganic setting are unthinkable), effect united life-sustaining processes. The problem is, as Galvani truly says, one of mathematical probability. Every such complex is just one particular case among innumerable other possibilities, ateleological, senseless arrangements of the same atoms, which in themselves are just as possible. It is, therefore, a priori most improbable, and although it is empirically given, it calls for an hypothesis to dispel the improbability. The doctrine of evolution solves many riddles, just this one it leaves unsolved. For, if the present forms have developed in uninterrupted regular causality from certain initial conditions, then these initial conditions, however simple, again must be particular cases of the same degree, since to each of the now imaginable ateleological combination belongs a different initial condition from which through the agency of the same natural forces, it necessarily had to develop. The problem of purpose, therefore, is only pushed back by the doctrine of evolution. This holds also in case the world process has gone on since eternity, for the mathematical ratio of the actual cases to the other possible ones remains the same. Some ordering principle is, therefore, logically necessary. If we call this principle an Intelligence permeating the world, we are already using an expression which belongs to a special realm, though it be the highest realm known to us. But if we realize the inadequacy of any conception and the impenetrable mystery of this primeval being, then this last step is perfectly in keeping with the spirit of scientific thinking.

4) *Psychology and the Philosophy of the Mind.* The separation of natural sciences and mental science is based on the fundamental differences of sense data and psychic functions, or of the respective contents of external (sensuous) and internal (psychological) perception. Phenomena and functions are directly presented to us in closest connection, but they are essentially different. Observation of the functions is the foundation of the mental sciences, which, however, are no more tied to their point of departure than are the natural sciences. Just as the latter proceed to the construction of the material outer world, so the former seek to understand the nature of psychic forces in general and the resulting actions and phenomena in terms of that inner life which alone is given to our observation. Psychology occupies the same place among the mental sciences as physics among the sciences of nature.

The investigation of sensory phenomena as such, which at the [p. 425] present time occupies such an important place, is not really psychology but simply phenomenology, a kind of prescience equally pursued by physicists, physiologists, and psychologists. Psychologists especially have taken it up because it offered a chance for exact experimental investigation and an opportunity to test the laws governing the psychic functions involved. I also have devoted most of my time to phenomenological preparatory work, but my real aim has always been to understand the functions.

a) *On phenomenology.* The statement that there are no simple sensations (phenomena) seems to me a decided exaggeration. We cannot observe tones without observing them, but this need not necessarily change them. According to all that we know about attention, it enhances its objects and favors their apprehension. Therefore, I see no cause for the barren skepticism of that popular objection, just as I cannot agree with the ambiguous statement of the "relativity" of sensations. Still, in my *Tonpsychologie*, I took my departure not from sensations but from "sensory judgments" prefaced by an investigation of the conditions of reliability, because sensations are given to us merely as contents of apperceptions which may be false or unreliable. Experimental psychophysics thus becomes a quantitative science of judgments. Among the sensory judgments, I distinguished the direct and indirect,

and was opposed to the mania for introducing everywhere indirect criteria which are merely side impressions. Further, I distinguished judgments of sensations and of sensory distances. Another thesis which I did and still do maintain is that relations among the sensations can be directly perceived in and by the sensations themselves. We cannot hear the relation between two tones, but we can notice it, and to notice is to perceive.

One of the main questions of phenomenology, it seems to me, is that of the attributes (fundamental qualities) of the sensations. Even in my book on space, the very center of my argument is the conception of the "psychological parts," i.e., of the dependent or partial contents which cannot be represented separately, because of their very nature, but can only represent independent modes of change in the total sensation. Husserl has developed these observations further in the conceptual direction. I discussed this also in my treatise on the attributes of visual sensation, but dropped the term "psychological parts" as inappropriate. In this paper I tried to preserve for the visual sensations the attribute of intensity, which is generally denied them at present. Quality, brightness, intensity, [p. 426] and extension seem to be inherent in all sensations, although in different degrees. In another main issue which was raised by Aristotle, namely, the question as to the unity or complexity of simultaneous and coincident impressions upon the same sense, I decided for complexity in the case of tone, and unity in the case of color; and rejecting all forced analogies, I have insisted upon the essential differences between these two senses with respect to their proper laws.

In the realm of tones, we must, first of all, determine the properties of simple tones, i.e., of those which are produced by vibrations of the sinus, since these, according to our experience, cannot by practice or attention be analyzed subjectively or dissected into parts, and, therefore, promise best for constant results. For their unfailling production I introduced the destruction of the overtones by interference tubes, demonstrating also that a sounding body responds only to a tone of approximately the same pitch and not to any fraction of it, as many physicists, following Wheatstone, formerly taught, and even Wundt tried to demonstrate by special experiments. In this way we gained a convenient device for analyzing tones or sounds, and it was found that tone sources, considered so far as simple, were still quite complex. In consequence of these developments, Rudolf König's famous series of observations with electromagnetic forks and the wave-siren, for instance, lost their point, which was directed against Helmholtz.

My views on the fundamental qualities of simple tones have changed since the *Tonpsychologie*, as I now recognize the "musical quality" recurring from one octave to the other, besides the "pitch," which simply runs parallel with the vibration figures, i.e., I accept the former as an equally original element in the individual development. This quality I discussed in detail in the *Tonpsychologie*, believing at that time that it could be treated as a by-product of the fusion of the octave tones, though of course, I have always recognized it as a fact.

The differences of fusion, which are now generally admitted in psychology, are also an old inheritance. They were known in part even to the Greek theorists. But even before I was aware of this fact, I discovered them at the piano during my sojourn in Prague, and later proved them by statistical evidence obtained from unity judgments of unmusical subjects. The differences appearing here in the figures of the unity judgments have afterwards been confirmed again and again.

[p. 427] Because of the importance of these differences for the theory of consonance, I was interested also in cases where they do not occur, namely, at the highest pitch and in the shortest tone impressions. This led me to my studies on the determination of the vibration-rate of very high tones through their difference-tones. This method showed that Appunn's tuning-fork series, then in general use, were marked with an absurdly high pitch. In the case of extremely short tone-impressions, it was shown that, instead of the musical intervals, only the distances were judged. Maltzew later obtained similar results for very high, hyper-musical pitch.

The fundamental phenomenon of music, namely, consonance, I defined in terms of fusion, and believe to have demonstrated at least the inadequacy of other definitions, including that of Helmholtz, and the falsity of the dualistic theories of consonance of Riemann and von Öttingen. I distinguished, however, between consonance and concordance, of which the latter is not a purely sensory quality of tones but depends on the introduction of consonant triads as the basic elements of our system of music. The rational motive for the construction of triads seemed to me to lie in finding, within the octave, the greatest number of tones consonant among themselves. This yields the division of chords into concords and discords and the foundation of the entire classical harmonies.

My views on the definability of consonance in terms of fusion have changed since then. I believe that we can recognize such elementary relations even in successive tones but that this fact can be explained only physiologically, not psychologically. Fusion, however, and consonance of simultaneous tones, now appear to me as consequences and not as causes of the relation. But the differences of fusion maintain, nevertheless, their great significance for the musical hearing and for the emotional effect of the intervals.

Massbestimmungen über die Reinheit konsonanter Intervalle was a study of "musical ear" performed partly on myself and partly on others. We determined certain deviations from the physically pure pitch, which appear to be based neither on the well-tempered nor on the Pythagorean pitch, but upon powerful, aesthetic motives and are most clearly marked in unusually musical people. Most striking was the constant elevation of the ascending octave in most simple tones by members of the Conservatory of Music, most of all by Joachim. In playing double tones on the violin, of course, it remains pure.

[p. 428] The article on subjective tones and double hearing compares observations made on myself in this field with entoptic phenomena in other fields which had so far been neglected. How subjective tones are to be fitted into the theory of hearing is still unknown; for this very reason an exact description of the circumstances of their occurrence seemed desirable, and I had only too much opportunity to collect material for it. The rare phenomenon of double hearing came to me as a sort of compensation after the operation of piercing my left tympanum.

In the tone-tables the formulae for calculation of intervals have a fair claim to more than immediate interest, as they serve for correct computations and predictions quite apart from the particular ratios presented, a fact which has some significance even for

metaphysics.

The main outline of the purely physical treatise concerning compound wave-forms dates from the Würzburg period, when I still entertained doubts of Helmholtz's alleged analysis by means of the cochlea, wherefore the qualities of compound vibrations, as such, seemed important to me. But the very fact that the natural classes of these vibration forms do not appear at all in the phenomena of sound themselves is new evidence for Helmholtz's hypothesis. Many questions discussed in this connection, as the definition of the period in such wave forms, have since interested even physicists.

In the monograph on combination-tones it seemed important to describe as fully as possible the phenomena and laws of this most difficult subject, where only well-trained observers and co-observers can be used as subjects. The derivation of these tones from the properties of the membranous parts of the organ of hearing is now a task for physiologists.

I made many observations on the subject of beats (inter-tone, etc.). The fact that these may sometimes be obviated, by holding one of the tuning forks to one ear and the other fork to the other ear, whereas the discord remains, gave me in 1875 the first decisive proof against Helmholtz's theory of consonance. In other connections, too, I have frequently found the phenomena of dichotomous hearing instructive.

Contrary to the common theory of non-spatial property of tone sensations, I claimed place-criteria for both ears and differences of volume for high and low tones. The possibility of locating correctly in a few minutes -- without moving the head -- up to ten tones simultaneously [p. 429] heard (Baley) can be explained only by such immanent place-criteria. Von Hornbostel and Wertheimer are known to have made further surprising discoveries concerning the power of localization through the ear; the former has now extended his investigation to the acoustic perception of distance.

The analysis of vowels, sounds of speech in general, and the synthesis of vowels based upon these, constituted the subject-matter of my last experimental investigation, wherein extensive interference tests played a leading rôle. I postulated three initial conditions for the synthesis: a large number of perfectly [*sic*] simple tones, a delicate and constant regulation of the volume of each tone, and a guarantee of the naturalness of the vowels, obtained by unconscious tests. The results have been reported in several articles, and a book containing all of them is almost completed. For general phenomenology those views are particularly relevant which deal with the so-called "complex qualities," and are the result of all these observations. My experiments proved Helmholtz's much-discussed foundation of the theory of vowels to be correct. For most of the consonants, too, the pitch could be determined, and analysis was possible up to a certain point. Furthermore, the same methods of analysis and synthesis could be applied to musical instruments. The results of the experiments with sounds of speech have not only been included in textbooks of physiology, but have also been applied by aurists, and by telephone and radio experts, who thereby have confirmed them.

The laws governing the relation of the sensations to outside stimuli, namely, the law of specific energies and Fechner's law, also figure in my work. I believe that the difficulty of conception of Fechner's law may be solved by its interpretation for distances of sensation (a viewpoint reached independently by Delboeuf, Hering, Ebbinghaus, and myself), and by the fact that in regard to pitch a striking confirmation of it, or analogy with it, was found in the Asiatic musical scales with equal intervals (Siam and Java), which depend not on tonal relations but on judgments of distance. This formulation is, of course, not intended as an explanation, but only as a psychologically correct expression of the law. The physiological derivation which is currently accepted I consider correct, at least in regard to intensities.

I also count space among the attributes of phenomena. This view, which means that color is impossible without extension just as extension is impossible without some quality, that, therefore, even [p. 430] the very first visual sensations must somehow appear spatial (nativism) has almost completely replaced the empiricism of Lotze's time.

Muscular sensations, which had been identified with spatial ideas or were considered at least as their indispensable conditions, must be content to play a humbler part. Only the third dimension, which obviously is not so well represented in our intuition, is still struggling. The three syllogisms of my book on space I can, indeed, no longer approve in their given form; they were really only meant to be descriptions of that which we find in our ideas of space, in the way of necessary properties of depth. Some other things in this part of the book no longer hold true.

But I should like to point out that I have never conceived of spatial sensations as depending directly, and only, on the stimulus but have always emphasized concomitant effects of central factors, as, for instance, in the case of visual size.

For the notion of time I retained Brentano's original conception, that it depends on continued existence, with a subjective backward relegation of all mental contents, during a short period of time. These "continued" contents, however, seem to me non-perceptual; which is of especial importance in the much-discussed question of the comparison of successive data.

The question as to the difference between mere conception and sensation, finally, is another problem of phenomenology. Purely sensory ideations -- this was the result of my thorough investigation -- are phenomena of the second order, which differ from those of the first order, mainly by their very inferior vividness and fullness, as well as by some other characteristics.

In so far as they rest upon associative causes, the laws of their origin (reproduction) may be brought under the formula of "contiguity" or "complementation," besides which no special law of similarity is necessary. It may be questioned, however, whether reproduction ever takes place in a purely mechanical manner, or whether there are always certain functional activities involved. Moreover, there is a purely physiological type of reproduction without associative causes, which is not surprising, considering the fundamental indifference of sensation and ideation. In dreams this type is probably predominant.

b) Psychology in the narrower sense. The elementary psychic functions or states are

characterized by definite fundamental properties: (a) by the peculiar relation between action and content whereby [p. 431] the content may consist of sensory phenomena, but also of non-perceptual elements or even of functions); (b) by the lack of spatial properties in self-observations (although they doubtless occur in objective space); (c) by specific laws of structure. Among themselves they possess many qualitative differences, and it is quite hopeless to try to trace them back to one fundamental function, as sensualism and voluntarism aim to do. In the first place, the intellectual and emotional functions are distinct, and within each of these divisions there is a hierarchy of functions such that each member subsumes the preceding: in the intellectual sphere we have perceiving (distinguishing), combining, conceiving, judging; in the emotional realm, the passive and active emotions.

These as a whole are based in turn on certain intellectual functions, to which, however, they are added as new non-deducible material. All these relations present a picture of various structure, whose peculiarities have not yet been fully described. Not the least of Brentano's merits lies in the fact that he realized the importance of this task and accomplished a large part of it. Among his pupils, Marty, Meinong, and Husserl especially have worked along the same line. Lotze, before Brentano, called attention to the peculiar structure of the functions of consciousness, especially that of "relational thinking." After Brentano, though probably not at his suggestion, Dilthey emphatically advocated a structural psychology. His interests and achievements, however, were distinguished rather by a delicate and sympathetic understanding of psychic connections in general, of the spiritual history of individuals or of groups, than by close analysis of elementary psychic structures -- "microscopic psychology," as Brentano used to call it.

My treatise concerning the concept of emotion was directed mainly against the sensualistic definition of James and Lange, while, in my work on sensory perception I treat the sensuous feelings as genuine sensory phenomena. The later thesis I had to defend against misunderstandings. It is not really as revolutionary as it seemed to some people; quite aside from the fact it was simply a restatement of an older theory, which has long been known to psychologists, especially in England, I did not deny the close instinctive connection of this class of sensations with acts of pleasure and displeasure, of desire and disgust, but had emphasized it everywhere and for this very reason had chosen the expression "feeling-sensations." The only exaggeration was the incidental statement that expressions such as [p. 432] "pain" or "pleasure" (referring to physical causes) denote mere sense data. In everyday life their meaning generally includes those instinctive emotions.

Through the entire mental life of man we perceive a dividing line which separates, in every domain, the higher from the lower functions; this dividing line is posited with the occurrence of general concepts. No matter how many attempts have been made to identify these with individual conceptions, the results cannot bear critical examination. Of course, to describe their effectiveness in shortening the process of thinking, etc., is not the same as to analyze their character -- just as the physiology and anatomy of the lung are two different matters.

Among emotional functions the affective and volitional processes presuppose certain concepts, just as logical thinking does among the intellectual functions. Wishing is the desire for something which is conceived somehow as valuable and as a consequence of my momentary affective state. Both conceptions, that of value and that of causality, in their more general and most primitive form, are discovered through our inner perception of the lower cravings which are prior to volition. The will, therefore, cannot be a primitive element, but only an evolutionary product of the intellectual life.

In the animal world we seem to see pretty clearly of what mental life is capable without conceptual thinking -- and it is a good deal. But no a priori prejudice would detain me from admitting the beginnings of higher functions, if the facts sustained such a theory. But in

that case, too, the first traces of conceptual thinking would have to be taken as something specifically novel. Although the physical development of the "new brain" may progress continuously, its psychic counterpart cannot proceed without some discontinuity. But then nature does take a leap occasionally, probably even in the physical field (quanta, heterogenesis, mutations), certainly in the psychophysical, where even the appearance of every kind of sensory quality doubtless represents such a leap. And does not the most miraculous leap occur every time the physical process of conception and embryonic development give rise to psychological life? The discontinuities are merely hidden and toned down, as it were, by the fact that the new phenomena appear at first in such tiny beginnings; but qualitatively there is a new thread in the tissue. This does not affect the inherently determinate evolution of the world.

Among the fundamental problems of general psychology, the question of unconscious mind is still one of the most urgent. Unconscious [p. 433] functions, strictly speaking, have not been proved by any arguments so far produced. On the other hand, there certainly are unconscious predispositions, such as all psychic activities leave behind. Besides, I consider unconscious or, better, unnoticed partial contents of the phenomena possible and real.

They form the lower boundary line of the various degrees of being noticed; often the slightest intensification of attention will suffice to notice them. When we separate functions and phenomena, there is no fundamental difficulty in this theory.

If we admit unnoticed partial contents, we shall have no difficulty in defining the character of our perception of Gestalt, upon which certain young scientists of my acquaintance, who have done commendable work in studying its laws, would like to base, it seems, not only the whole of psychology but even logic itself.

I make a distinction between psychic functions and psychic structures, which latter constitute the specific contents of the former. Thus, from summarizing I distinguish the notion; from judging, the state of affairs; from conceptual thinking, the conceptual content; and from feeling and desiring, the passive and active value. These elements have, of course, no independent reality, like Platonic ideas, but still I should not call them fictions as does O. Kraus, who takes Brentano's later writings for his authority; that expression seems to me dangerous, and liable to being misunderstood, since it admits of a skeptical, subjectivistic, or relativistic interpretation. Structures form the starting-point and subject-matter of the science which I call eidology.

By soul I understand a unity of psychic functions and dispositions, and agree with Lotze in deeming it unnecessary to seek behind this unity a mediating or supporting "something."

Since a strong will draws everything into its domain, and since those functions and dispositions which are connected with the will, and especially with the moral will, play the leading rôle in the life of the adult, the will is justly considered the nucleus of personality; and this seems to me to be the element of voluntarism. The will is not the root of evolution, but its crown.

If I wanted to draw a distinction between soul and mind, I should use the latter term for the totality of the higher life of the soul. Throughout the animal kingdom, we find embryonic stages of those social elements in language, art, community life, etc., which are based on the

cooperation of individuals, and are the subject-matter of the [p. 434] special mental sciences; but here, again, the transition is not continuous and the novelty, in the last analysis, is always a product of conceptual thinking. In *Anfänge der Musik* I have tried to establish this fact more concretely within that art. The possibility of sympathetic "re-experience" (*Nacherleben*), upon which the entire structure of "insight-psychology" is based, arises only upon the level of strictly human developments. Any expert in intellectual history will insist on the reality of certain laws, though these may not be given in the precise form of natural laws, and I should even admit Hegel's triadic rhythm to have some plausibility in this connection.

5) *Ethics*. My views and ideas on this subject I developed almost entirely in lectures, but in my address on ethical skepticism I suggested the main points. Like Brentano, I see an analogy between the way our notions of intrinsic goodness or value are based on the apodeixis of feeling and the way our theoretical understanding rests on the apodeixis of self-evident propositions. The empirical derivation of altruism from egotism is entirely wrong. Our theory differs from hedonism, even altruistic hedonism, in that we recognize certain primary values beside pleasure, and from Kant's ethics in that we repudiate purely formal conditions. Truth, positive emotions (especially aesthetic), and kindheartedness (dispositions directed towards true values) are intrinsic values. One could find a comprehensive learned formula for this, but only at the expense of definiteness, and therefore it is impractical. A series of derived, but still very general, values, such as power, liberty, honor, etc., complete the "table of goods" (*Gütertafel*), which is not so very different from the Platonic table. Only such an ethics of goods or values can be developed logically in detail and also do justice to the actual changes of ethical evaluation by changing the coefficients, as it were, by which the abstract (absolute) values must be multiplied under different circumstances and conditions of life, in order to obtain the concrete (relative) values.

This is essentially what must take place in every case of individual moral or ethical decision. The modification of abstract values for any concrete case depends upon certain perspectives, and these are assumed in our ethical reflection. The highest good or happiness (eudaemonism of the ancients) is *in abstracto* the totality of intrinsic values, *in concreto*, the totality of genuine goods which are possible under the given conditions of life for the individual and, furthermore, for humanity in general, including extrinsic goods as well. The conception of the transcendental ideal (the

[p. 435] Platonic idea of the good) can, of course, be derived only from empirically given true values by a process of augmentation. The question of egotism-altruism is solved thus: everything truly good is worthy of attainment in and for itself, under any condition, so that in each individual case not the point of view of ego or alter but only the greatest possible intensive and extensive realization should be decisive. Ethical action is purely objective action, as scientific cognition is purely objective judgment.

With regard to the free-will problem, it seems to me that the interests of ethics, for which alone it has any significance, are quite compatible with a determinism which considers ethical insight itself as a power to be developed by training and self-control. Freedom becomes synonymous with the possession of ethical insight, and is, therefore, not given once and for all, but evolves and grows with the whole ethical personality. Legal punishment recognizes free will only in this sense.

6) *Metaphysics*. Metaphysics can be fruitfully developed only from the ground up, as a continuation of sciences whose data it undertakes to generalize still further. Apart from the problems it inherits from the lower sciences, it is chiefly concerned with the relation of the physical to the psychical and the ultimate questions of God and immortality which everyone

who would be called a philosopher must answer after his fashion, and from the life-long consideration of which even a dogmatic critical philosophy should not detain him.

Against the parallelistic point of view concerning body and soul, which was so popular with psychologists and physiologists in the last third of the past century, and was presented especially by Fechner in a most brilliant and fascinating manner, I have taken sides with the older theory of interaction, which merely requires sounder rational development; and recently this has gained ground again, even among the pupils of Wundt and Erdmann. The objections derived from the law of energy are easily answered, while the experiments of Rubner and Atwater can be fitted just as well into the theory of interaction. Parallelism is conceptionally obscure, and in view of the difference in structure of the physical and psychical it cannot be developed logically and compels us to assume a causal series extending forward and backward, for which there is not the slightest empirical evidence. It logically ends in panpsychism, which I can look upon only as a scientific fancy, and even so of doubtful charm. For [p. 436] nature is imbued with poetry only if we animate it with human spirit. However, the two opposing factions have converged in large measure, which is due partly to the greater refinement of the conception of substance and causality, partly under the stress of the facts; I dare even hope for a union of the two, in the not too distant future, toward a "monism of interaction and evolution." The metaphysician may also consider Spinoza's idea that besides the two attributes known to us there are innumerable other expressions of the world foundation, either in existence or in process of evolution. But here, of course, difficulties will arise out of the very idea.

The similarity of the qualities of the final particles of matter and the interaction between all contiguous parts of the world, or of interpenetrating parts (such as nerve-centers and psychic elements), cannot be accepted as ultimate facts of the world, if the above-mentioned maxims of research, e.g., the law of probability, are to hold good. A homogeneous world principle must supply the foundations of all things, and from the very first one is inclined to identify it with the spiritual ordering principle postulated for the organic world. The conflict between theism and pantheism loses its edge when we ask what the real meaning of causality, substantiality, and personality is, and what they may still signify here. What remains is the eternal dependence of every individual upon a fundamental essence, but as to the manner of being conditioned and as to the fundamental essence nothing more can be found out. Even the conception of spirituality we can understand only in a "transcendent" sense.

Likewise, the most difficult of all questions, that concerning the origin and reason of evil, remains insoluble. Whether, like the theists, we fall back upon the "inscrutable decree of God" as our last defense, or, more pantheistically, harp upon the connection of the divine Spirit with the laws of nature, or conceive of evil, even of wickedness, as a part of God's nature, and look upon the development of the world as the immanent becoming of the absolute: it amounts to just about the same thing. To many people the notion that God suffers with us and in us might even appear as the greatest comfort. Undoubtedly the struggle with the problem of theodicy has led many to pantheism, especially in its intensely mystical forms. But in these matters, just as in ethics, learned formulae serve no real purpose save that of hiding our ignorance. Even the pantheist may in the darkest hours of trouble place his life and fate in the hands of [p. 437] God, and in time of greatest happiness thank his Creator that this world, full of sorrow though it be, is also full of joy, and that he was given a heart to appreciate it. It is, after all, a matter of degrees of anthropomorphism, and can be talked about only in metaphor. If even natural science apprehends the laws of the external world by means of symbols, why should we completely repudiate symbolism? Symbols are not mere fictions by any means. Only their status must be remembered

lest the name of God be misused and the anthropomorphism carried altogether too far.

The consciousness that our life was planned for Eternity has never left me. Although the spiritual originates in the material and during our existence here must constantly be stimulated and nourished by sensory impressions, still it does not seem to be entirely dependent on them. A continued existence of the higher mental life, proportionate to the degree to which its nucleus, the moral personality, has developed, is thinkable, howbeit the form of this existence remains entirely unimaginable. Surely it was not narrow egotistic motives that inspired men like Lessing, Kant, and Goethe, as well as Lotze, Fechner, and Brentano, to hold to such ideas, but the feeling of respect and awe of the Eternal within us, and the senselessness of a world in which the only creation of real value arises merely to be obscured again, and finally to vanish entirely.

I need hardly mention that spiritualistic and occult tendencies never interested me. It is a matter of taste whether one likes to be taken in and whether the guitar-strumming of the mediums, their wise sayings about the future life, and their other emanations seem to be sufficient compensation.

7) *Aesthetics and Science of Music*. Reflections about the effect of art, especially of music, formed the beginning of my scientific thinking. In conferences and lectures, I have often discussed aesthetic problems, but have published only one of these lectures, *Die Lust am Trauerspiel* (1887). It seemed to me that this ancient question could not be solved by finding some one principle of explanation, but rather by observing the cooperation of all mental qualities, from the mere desire for sensation to the loftiest ethical and metaphysical ideas. Another fundamental idea was that truly artistic enjoyment does not depend on being carried away instinctively, but develops gradually, concomitant with an objective, imaginative survey, wherein the totality of actions and characters presents itself to us like a pageant. Empathy is only a way-station. Even the [p. 438] ethical effects, to be artistic, must be conveyed by observation of ethical dispositions in this spirit. Only within such a setting does the defeat of the hero achieve artistic effect. Finally, I called attention to the difference between the instant-effect and the aftereffect, which was elucidated at considerable length.

The other arts seem to lend themselves to the same approach. It was not my good fortune to develop it systematically for the art of music, where the determination of the aesthetic object is especially difficult, and where all important questions of aesthetics converge. Three main factors I would distinguish in the musical effect, which, however, may be combined in most different relations according to the individual: the purely sensory euphony (including the sensory effect of rhythm), the delight in the construction and technical execution, and, finally, the enjoyment of the content of the composition. In this third, highly controversial, point my ideas coincide most nearly with those of Lotze.

But my real purpose was to carry these controversies, which were discussed *ad nauseam* in the accepted aesthetics of music, into a greater universe of discourse, namely, psychology of music, and to fit this in turn into a general systematic science of music. To most professionals, even at the present day, the science of music means only the history of music. And yet, for this very art, leaving aside its profoundest effects, the conditions are

extraordinarily favorable for an objective, logical understanding. Physics, physiology, ethnology, general aesthetics, and philosophy could cooperate with the history of music. My efforts to encourage such cooperation have met with gratifying approval, but also with resistance. Since the time of Helmholtz and Spitta, the philosophical faculty of Berlin has recognized the need of such a connection by requiring knowledge of the systematic branches (acoustics, tone psychology, aesthetics of music) on the final examination in musical theory.

To the systematic science of music belong, besides my works on physical and psychological acoustics, especially the treatise, *Psychology of Music in England*, and the book about the beginning of music[5]5. In the treatise, which is an introduction to the later works on *Tonpsychologie*, I discussed the relation of music to language, and of human speech to the utterances of animals -- with reference to Spencer [p. 439] and Darwin -- but also the exaggerated nativism of Gurney (power of sound), who practically ignored all genetic explanations and resorted entirely to the erotic feelings of animal ancestors. Here the ground had to be cleared for some explanation based upon mnemonic experiences of the individual and upon musical thinking as a product of such experiences. Gurney, incidentally a connoisseur of music, published an answer to my observations (*Tertium Quid*); to this I did not reply, as I did not wish to continue the methodological controversy which Lotze has aptly called "a mere whetting of knives." Later on, especially in Külpe's school (also in England and America), the effects of single intervals were tested on many subjects and their statements carefully recorded. But these experiments, it seems to me, dealt only with superficial and accidental data and thus have little significance for real musical feeling; besides, one seemed to forget that isolated intervals lose their real effect, which depends mainly on compound chords and sequences; and that, furthermore, satisfactory judgments could be passed on such separate data only by someone gifted in music as well as in psychology, who could give prolonged attention both to the total structure of our music and to his own experiences. But even he will not presume to put the deepest thoughts concerning the whole or the details into words -- and that is well.

My studies of musical ethnology and comparative science of music I have already reported in Part I. All that had so far been presented in histories of music as specimens of exotic music had for the most part been collected by travelers and was based generally on unreliable first impressions of the melodies, which, to make matters worse, were, often harmonized according to modern European patterns. But, after A. Ellis had accurately determined the scales of different exotic instruments and W. Fewkes used the phonograph for making records of the songs, the way was open for an exact comparative musical science, and this was most effectively developed in our small circle in Berlin, especially by von Hornbostel. We know now, without appreciating the wonderful masterpieces of our period any less or intending to advocate a return to primitive forms, that the "world language of feeling," alleged to be universally understood, has not only undergone enormous changes in the course of time, but presents equally significant simultaneous differences on the different parts of the globe. The impressive development of harmonic music has led many, even Hugo Riemann, to the foregone conclusion that [p. 440] all music had to originate in triads, and that a hidden harmony must lurk even in one-part music, as though neutral thirds and other deviating intervals could be only discordant approximations to an intended pure interval. Such prejudices have been set aside; only occasionally is a false friend of ancient Greek music tempted to perpetrate stylistic outrages of harmonization.

We know a great variety of musical forms, among them the heterophonic type widely used in Asia for which I suggested the name of *heterophony* in accordance with a passage in Plato's *Laws*, where probably the same musical form is referred to. We know that the wonderful expressiveness of our harmonies is hampered by certain

rhythmic limitations, and that not only the ancient Greeks but also many primitive races excel us in regard to rhythm. I need not point out how much general aesthetic science, too, gains by such a widening of the horizon.

Anfänge der Musik, a little book based on a public lecture, traces the origins of music back to the practice of signalling and the phenomena of tonal fusion, summarizes the general conclusions I had reached through my comparative studies, and adduces several well-authenticated examples, chiefly phonographic; and furthermore it attempts a review of the most important basic forms of music production, as these have appeared in the course of time.

Two of my articles on the science of music are purely historical, yet even these are closely connected with theory; I mean the essay on the concept of antiquity, and that on pseudo-Aristotelian problems of music. For years, these problems had fascinated me, since they represent a kind of ancient tone psychology, which is of the highest value for the deeper understanding of the music and apperception of music of classical antiquity. How much light does the single sentence, "The consonant chord has no ethos," throw on the entire ancient musical consciousness? I did, indeed, come to the conclusion that the treatise as a whole could not have been written by Aristotle, or even during his time, but belonged to the first or second century a.d. I believe to have proved this as well as such matters can be proved. Among the few philologists who had studied the treatise, Ruelle declared the matter settled thereby (*tranchée*), whereas Th. Reinach, whose forced interpretations of the text I had criticized, attacked my article in such an insulting manner that I could not reply. The comprehension of many parts, here just as in meteorological and other types of problems, is possible only for one versed in that line, i.e., here acoustics, tone, and music psychology. This is [p. 441] especially true of problems concerning the peculiarities of octaves, fusion, and antiphony. My interpretation and correction of the text in Paragraph 14, which so far had been perfectly obscure, but is perfectly comprehensible in the light of fusion-phenomena, was approved by Usener and von Jan, later also by H. Riemann. A short notice in the *Literarisches Zentralblatt* remarked that very few people would appreciate the time and effort I had spent on these articles. The author counted himself among these few, adding regretfully: "Graeca sunt, non leguntur." This experience discouraged me to such an extent that I did not continue the history of the conception of consonance through the Middle Ages up to modern times. Later, Riemann gave a sort of continuation in his *Geschichte d. Musiktheorie im 9-19 Jahre*.

These are about the outlines of my scientific views and ambitions, which I was destined to carry out only in part. The work that I did do I should like to see improved upon now, and I am well aware of my shortcomings -- of all my works, only the *Tafeln zur Geschichte der Philosophie* went through "revised and enlarged" editions. Many buyers probably mistook it for a syllabus. Thus, I had no chance to correct mistakes. But I am quite certain that the observations and experiments which I carried out with the utmost care will stand and will not have to be repeated. The general ideas, enlightening and valuable as they seemed to me subjectively, must submit to the sifting, trying test of time. Whatever truth they contain will prevail by its own virtue. I have never endeavored to found a school in the strict sense; and have found it almost pleasanter, certainly more interesting, to have my students reach different conclusions than to have them merely corroborate my theorems. I derive all the more joy and gratitude from the loyalty of the young people who, in the same scientific spirit, but by their own independent plans, continue the work of research.

Footnotes

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[1] Further details of the developments of the Institute up to 1910 will be found in Lenz's history of the University of Berlin, Volume 3, and in the annual chronicle of the University.

[2] In the "apodeictic judgments" traditional logic jumbles together four conceptions which are by no means always identical: necessity, certainty, self-evidence, exactness (Brentano).

[3] To the axioms belong also those expressions which state the connection between premises and conclusion of a compelling syllogism -- "normative axioms" -- which one cannot deduce from experience without incurring a vicious circle.

[4] Brentano deduced the law of causality in its most general form (no change without cause) a priori, but at the same time made use of the laws of probability. I have my doubts concerning this "immanent induction." The probability of the law according to this conception (which is essentially that of Helmholtz) becomes immeasurably great and can be considered equivalent to absolute certainty.

[5] Besides this the aesthetics of music will be found in several later publications, also in a popular article in the Berlin *Volkskonzerts*, and in some reviews.

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