JULES PRUSSEN Essays and Conferences PUBLICATION OF THE GRAND-DUCAL INSTITUTE SECTION OF MORAL AND POLITICAL SCIENCES LUXEMBOURG

Jules Prussen, the man and the thinker

On February 1, 1976, our country suffered the loss of one of the most eminent representatives of our intellectual life. On that day, Mr. Jules Prussen, effective member of the Section of Political and Moral Sciences of the Grand-Ducal Institute, president of the philosophy sub-section, corresponding member of the Section of Natural, Physical and Mathematical Sciences, professor at the University Center and the Athénée, succumbed to a sudden attack. Yet it was known that Jules Prussen was very ill, and he himself felt the imminence of the fatal outcome. But everyone hoped that his nature, formerly of astonishing vitality and robustness, would once again triumph over the disease, especially since he was known to be in full activity, finally engaged in the definitive drafting of his reflections and meditations, and that all of us needed his enlightened judgment, his immense knowledge, and his friendly support.

Born in Rodange in 1914, Jules Prussen spent his youth in Esch-sur-Alzette. An exceptional student at the Athénée, he decided on teaching and passed his exams brilliantly, most with distinction. At the Sorbonne, at the Lycée Louis le Grand, where he did a year of internship, he left the strongest impression on his classmates and teachers. In university circles, especially in Paris, the elegance and accuracy of his expression, the rigor of his reasoning, and the breadth of his knowledge were highly esteemed. What a magnificent University Professor he could have become! But Jules Prussen devoted the best of himself to the education of the elite of our youth at the Athénée, the Advanced Courses, and the University Courses. He never stopped making his students benefit from the fruits of his studies and meditations. While actively devoting himself to intellectual research, he personally paid the price to keep the standard of our teaching high, as any threat of debasement shocked and discouraged him.

His students, like his colleagues, admired the immense intellectual horizon of this master of the word, combining precision and clarity of expression with the harmony of discourse and the poetic sensibility of evocation. A humanist in the true sense of the term, one of the last to devote himself to the contemplative life in a world dominated by technology and the concern for practical efficiency, Jules Prussen was imbued with the best sap of Greco-Latin civilization. Homer, Aeschylus, Euripides, Plato, Cicero remained his favorite authors, whole passages of which he knew how to recite, in appropriate circumstances, with an inimitable flair. An excellent Latinist, he mastered the principles of versification to the point of constructing, as if it were a game, verses and chronograms of perfect precision, balance, and rhythm.

But he plunged with equal ardor into French literature, for which he enthusiastically inspired entire classes year after year. Dispersed to the four corners of life, his students remember with admiring respect his explanations of Montaigne, Rousseau, Baudelaire, Mallarmé, Proust, and Valéry, whose hidden and unsuspected treasures he excelled at revealing. But German literature was by no means foreign to him. It is curious, however, to see his preferences there gravitate towards the unfathomable depths of the poetry of E.T.A. Hoffmann and Kleist.

In music, both limpid and mysterious, he saw the highest expression, the most perfect creation of which the human genius was capable. But is it not astonishing that this servant of reason, always enamored of the precision of expression and the rigor of deductions, dedicated an almost religious cult to the most unfathomable, the most irrational, indeed the most Germanic of composers of genius. This harmonious complementarity between the demand for rational clarity and the attraction of the mysterious depths and aspirations of the human soul perhaps best characterized Jules Prussen, thinker, poet, and music lover in the indissoluble unity of a rich and strong personality.

But Jules Prussen always devoted his most generous and fruitful efforts to philosophy. Having dedicated himself, since his youth, to reflection and contemplation, the professor of philosophy was at

the same time an authentic philosopher who had placed the **autonomy of the human personality**, the **freedom of thought**, and **moral integrity** at the center of his intellectual universe.

With admirable skill, he succeeded in evoking the great figures in the history of human thought, extracting, through a close and uncompromising analysis, the angular ideas of a complex system, before performing the enriching synthesis that opened up vast perspectives and communicated to the listener a spark of the critical enthusiasm that animated him. No corner of this vast domain of philosophy remained foreign to him; even Oriental thought attracted him, he who could read many texts in the original language. At regular intervals, he revisited the fundamental works of the great thinkers that are Plato, Descartes, Leibniz, Kant, and Hegel. But Anglo-Saxon philosophy of our time was just as familiar to him; he had thoroughly studied Wittgenstein, Carnap, Ayer, Blanshard, and many others. His own domain was certainly the theory or rather the analysis and critique of knowledge. But, contrary to contemporary logical empiricism, he never isolated knowledge from metaphysics. The main chapters of his course, taught with mastery, depth, and sobriety, reveal the major axes of his reflections and meditations: the **paradoxes (aporias) of knowledge**, **evidence**, **truth and error**, **explanation and understanding**, the **angular problems of metaphysics**. It is here that Jules Prussen revealed himself as an authentic philosopher, knowing how to assimilate and coordinate his vast knowledge, illuminating it by reflection to derive the principles of a purely personal wisdom and the norms of conduct in harmony with his convictions.

Let us also not forget that Jules Prussen devoted a particular interest to the great scientific problems. Logic and epistemology naturally brought him into contact with mathematics. Certainly, he did not have the necessary leisure to cultivate the algorithms of calculation, but the basic questions concerning the foundations of mathematics attracted him; non-Euclidean geometries and the interpretation of the calculus of probabilities constantly held his attention. Should we be surprised to see him constantly preoccupied with the great problems of the natural sciences, problems that relate simultaneously to metaphysics, epistemology, and the exact sciences: the **spirit of mechanism**, **space and time**, **determinism and the current evolution of physics**, the **question of substance** and **new conceptions of matter**, **organic evolution** and the **question of finality in biology**. In his eyes, philosophy and science could only form a hierarchical whole, scrutinizing the structure of reality through complementary methods.

It is evident that a man of this quality must be demanding, and this primarily towards his own person. His beautiful, clear, and neat handwriting betrayed a voluntarily imposed discipline and the concern for a job well done. Yet, in his convictions, his affiliations, his judgments, and the orientation of his life, this man—whom the enemies of effort and the amateurs of easy solutions judged as uncompromising, even meanly draconian—refused mediocrity, facility, and pragmatic, self-interested conventionalism. Insensitive to public honors and distinctions, disdaining favors, clumsy and disarmed by the rebuffs of certain temporary officials, Jules Prussen, very severe towards pretentious braggarts and blind sectarians, never refused his respect, or even his sympathy, for the convictions of others, provided they proved compatible with his humanist ideal. But certain political practices, any violation of conscience, any use of force to diminish the human personality, disgusted and revolted him. Very selective in the choice of his friends, he showed great attention and devotion towards those he judged worthy of his trust. A significant detail: one of his bedside books remained Cicero's *De Amicitia*. I believe that the term *pietas* in the authentic sense of the word best characterizes Jules Prussen's attitude towards the values of the spirit and life, towards his family, his friends, and his homeland.

But this man, otherwise demanding and distrustful, showed an exquisite sensitivity towards children, in whose frank and natural laughter he found the counterpoint to his sometimes pessimistic meditations on the world of adults. Moreover, this rationalist, convinced of the power of the spirit, had opened his heart to beauty, friendship, poetry, and, above all, music, in which he proved to be a connoisseur. He

experienced the music of a Mozart or a Richard Wagner, a Mahler or a Bruckner, he knew all its nuances and was capable of savoring its inexhaustible riches.

On a personal level, life spared nothing for this man who seemed unshakeable as a rock. Exposed to the reprisals of the Nazis, these detractors of human personality and free reflection, he stoically endured the rigors of deportation and forced labor, and it was only at the cost of desperate efforts that, in that inhumane winter of 1945, he succeeded in saving his family in the final disaster that befell Germany. The painful death of his wife, whom he cared for with rare devotion, deeply shook him without hardening his heart. In these last years, the disease, which he knew to be relentless, dealt him violent blows without plunging him into despair.

Certainly, Jules Prussen published, over the years, a number of in-depth studies, each of which retains undeniable value. But the informed reader regretted not finding all these quality publications, some of which were no longer readily available on the current market, gathered in a single volume. Furthermore, in the years preceding his too-premature death, Jules Prussen had undertaken the drafting of a vast synthesis of his philosophical reflections and research, naturally encompassing the major themes of his teaching. A source so fertile in authentic intellectual and moral values, combining the rigor of reflection with the depth of analysis, the scope of synthetic approach, and the perfection of expression, should not slumber in the silence of oblivion, accessible at most to a few privileged individuals.

That is why the Section of Moral and Political Sciences of the Grand-Ducal Institute has the honor and duty to publish the fruits of the tireless philosophical research of one of its eminent members, to the great benefit and joy of all friends of vigorous, courageous, and fertile thought.

As the available material exceeds the dimensions of a single volume, the Section's Board of Directors decided to first publish the studies that appeared in various specialized journals, with the exception of an in-depth analysis dedicated to paradoxes. In 1986, on the occasion of the tenth anniversary of Jules Prussen's death, the major part of the posthumous work will appear, housing the best fruits of a thought exceptional both for its originality and its vigor. May these two publications serve and encourage all friends of philosophy and revive the memory of one of the richest, most competent, and most admirable personalities of our intellectual heritage. E. Wagner President of the Section

Publishers' Note Jules Prussen devoted his entire life to philosophy: hence the mass of writings he left behind. But he was a thinker demanding of himself: hence the small number of published texts. As the latter are only difficult to access, their publication dating back many years, and as the posthumous work is known only to a small number of close friends, the idea was born among some friends and admirers to bring this important work to the attention of the widest possible public.

It is currently planned, as a first step, to publish two volumes. Firstly, and this is the present volume, the texts already published, augmented by a writing entitled *Concerning Paradoxes* which, although it remained in manuscript form, seemed suitable for publication. A second volume is to present a vast unpublished collection, which would undoubtedly have become the *magnum opus* of Jules Prussen, had he had the time to put the finishing touches on it and had he been willing to cut short, for once, his relentless perfectionism. We have given it the title of *Apologia du solipsisme* (Apology of Solipsism), which appears in the philosopher's own papers. Finally, subsequently, a third volume could be envisaged, which would regroup both a selection of youthful texts, often more literary than philosophical, as well as a selection of philosophy lectures, the constantly reworked manuscripts of which are preserved. This volume would provide an overview of the diversity of Jules Prussen's talents and interests, as well as his *pedagogical eros*.

This edition is not intended to be scholarly. All commentary has been dispensed with, except that at the end of the volume, following the notes appearing in the original edition of the texts, translations of the

Greek and Latin quotations will be found. The references for the quotations have been checked or researched, and obvious typographical errors corrected — all with the sole aim of serving a better understanding of the text. We remain indebted to the *Revue de Métaphysique et de Morale* as well as the *Société des Naturalistes Luxembourgeois* for having kindly authorized us to reproduce here the texts which they had ensured the first publication of.

Hubert Hausemer Robert Koch Claudine Schabo -Prussen

SCIENCE AND PHILOSOPHY IN DESCARTES

Excellencies, Ladies, Gentlemen, I have the honor of submitting to you a few remarks on certain points of Descartes' thought, in order to commemorate with you the 300th anniversary of his death which occurred on February 11, 1650. The reasons for celebrating Descartes, maintaining his presence, and constantly referring to his example are evident enough that you can dispense with my developing them at length. Descartes — everyone knows it — is at the origin of **modern philosophy**; in the history of classical science, his importance is only equaled by that of Newton; and literature itself reveres in him a great model. Few men have left such a lasting and widespread influence. No one, except the initiators of great religious movements, has exercised such a profoundly renewing action. The novelty, the spontaneity of his genius, combined with so much verve, the density of a marvelously unified thought, and such keen lucidity, still hold the contemporary reader under an incomparable spell. He does not let go of us. Once you have met him, you know that you can only disingenuously evade that rigid gaze which makes it our duty to pay attention, an attention that is sincerity towards ourselves. And nowhere has Thought been promoted to such dignity and height.

It is above all the **scientist** that we will look at now. For I do not forget that I am addressing an audience of scientists, being personally a simple amateur in these matters. — To understand Cartesian science, let us relate it, very briefly, to its century. This century, the century of classical science, the century of genius, as Whitehead says, which at its beginning consecrated the Copernican revolution and whose publication of Newton's *Principia* marked the apogee in 1687, is first sadly illuminated by the flames of the **stake** where the Church killed **Giordano Bruno**, on February 17, 1600. Let us here pay homage to this thinker of genius who so admirably brought out the infinitism of the new astronomy, who, with ardent boldness, opposed the medieval vision of the world with his own intuition of the **Universe as one and infinite**, denying the Aristotelian "place," affirming the **relativity of movement**, conceiving, before Descartes, the **geometrization of space**. — Copernicus, Bruno, Tycho Brahe, Kepler, their discoveries, their theories, their intuitions will integrate into the work of the incomparable scientist that is Galileo. Galileo! In the history of thought, this man remains the absolutely irreplaceable individual who definitively **overthrew the false science**—but how tyrannically jealous!—of the Middle Ages; who definitively **confirmed, by resorting to experience**, the new theory of the Universe that abstract reasons alone had supported until then; who laid the foundations of the most astonishing edifice of modern times: **the mathematical science of nature**; who furthermore, and as if these achievements were not enough for his glory, established as a philosopher the general implications of the new methods: so that he also outlined the contours of the new metaphysics required, with a view to its indefinite extension, by the interpretation of the world solely through mathematics. He imperiously **eliminated the great principle of the Peripatetic explanation of Nature: teleology**, the consideration of ends, which, in order to then relate everything to the Pure Form which was God, made nature converge towards man considered as an intermediary between the world and God. With Galileo, the world tends to be a **pure machine** composed solely of mathematically regulated movements, and which is self-sufficient. — Man, with his desires, his ends, and his "sentiments," with the secondary

qualities of which nature has stripped itself and which he alone bears, man is **marginalized from the world** as a spectator without importance, without privilege.

It is to **Galileo's work** that Descartes' work should primarily be linked, although one can hardly speak of a direct influence exerted by one on the other; an ideal link, the immanent logic of modern thought, seems rather to unite them. Considered in the extension of Galileo's work, Descartes' work is above all this: **Definitive constitution of a purely mathematical science of Nature**, — this "mathematization" of Physics requiring a prior overhaul of mathematics with a view to its indefinite applicability; **Deduction of the philosophical foundations of the new method**; **Interpretation of the newly established place of man in Nature**.

We know that when very young he absorbed himself in mathematics and that at 22 years old he knew almost everything that could be known in these disciplines at the time; and that when he abandoned what he had learned at school, it was only mathematics that he retained. In 1618/9 — let us recall that he was born in 1596 — we find him occupied with experiments in mechanics, hydrostatics, optics, and music, verifying the mathematical method everywhere, that of Kepler, that of Galileo who was then at the height of his glory. On the night of November 10, 1619, he experienced a kind of **illumination** that confirmed him in the orientation of his research and imperiously encouraged him to pursue the great idea implied therein to the end: A quasi-mystical experience, made during a dream full of enthusiasm and dazzling, where, as Descartes himself explains, "the spirit of truth had wanted to open to him the treasures of all sciences," undoubtedly by revealing to him that **mathematics was the unique and sufficient key to access these treasures.**

The first studies to which he devoted himself after receiving this somewhat supernatural encouragement concerned Geometry. After only a few months, his ardor was rewarded by the invention of **Analytical Geometry**. — Analytical Geometry first rests on the idea that there is a **perfect correspondence** between the universe of numbers — represented by arithmetic and algebra — and the universe of space — geometry. That there is a correspondence between these two domains was naturally implied, from the beginning, in any mathematical preoccupation, and particularly in the practice of measurements. As for the system of translation which makes it possible to reduce questions of geometry to the solution of algebraic equations, it had been employed in a general way, before Descartes, by Fermat. It was Descartes' **stroke of genius** to conceive of this correspondence as **universal, perfect, and one-to-one**. He thought that the very nature of space was such that the relationships contained therein, whatever their complication, can always be expressed in algebraic formulas and that, conversely, numerical relationships can be represented in space. By its initial conception, Analytical Geometry is indifferently the application of algebra to geometry, or the interpretation of algebra by geometry.

But almost immediately the symmetry between these two functions is broken in favor of the first. Not only is the second — representation of the different types of equations by various kinds of curves — subject to conditions that restrict its exercise, but, above all, it is only the first which agrees with the idea that Descartes, since his memorable night, has of mathematics. His discovery is valuable in his eyes especially as it permits the **algebraic resolution of space**, the reduction of spatial figures to the equations of an algebra that rests entirely on an intellectual intuition of the relationships between any magnitudes, on relationships conceived by the understanding alone, — which is the general science of pure relationships. The notion of **"quantity"** will thus lose everything that was properly spatial about it. It will free itself at the same time from its dependence on imagination — which seems indispensable to the intuition of space. It will be **purely intellectual**. It will be the very expression of the capacity of the mind to lead and pursue **"these long chains of reasons"** to infinity. "Quantity" is thus synonymous with **"relation"** or **"proportion"**. Descartes' *scientia mirabilis* is "mathematical" in that "all those particular sciences commonly called Mathematics consider nothing other than relationships or

proportions" and that this science is founded entirely on the idea of relationship and proportion. And it is **"universal mathematics"** in that it considers relationships and proportions in their intellectual purity, having detached them from any particular substratum and thus making them capable of unlimited application and extension. It is in this way that the notion of **"dimension"** can notably be generalized. In his *Regulae*, drafted between 1620 and 1630, Descartes speaks of it as follows:

"By **dimension** we mean nothing other than the mode or the relationship according to which any subject is judged measurable, so that not only length, width, and depth are dimensions, but also weight is the dimension according to which things are weighed; speed is the dimension of movement, and likewise for an infinity of similar dimensions. Every mode of division into equal parts, whether effective or intellectual, constitutes a dimension according to which the enumeration is made." (Reg. XIV)

The horizon of imagination — restricted to space — is surpassed, "pure mathematics" is capable of infinite extension. At the same time that he applied himself to reforming mathematics in order to make it this universal science that would be nothing other than intelligence in exercise, the "continuous and uninterrupted movement of the mind" — of which the *Regulae* will speak, — at the same time that he reduced geometry to algebra, whose general meaning he had fully established, Descartes, during those feverish years, was trying to realize another great idea: **to reduce the physical to the geometrical.** This was Galileo's idea. The latter had seen that nature, whatever else it may be, is undeniably a **geometrical world** in the sense that the objects that compose it are extended and figured magnitudes in motion: If we succeeded in stripping nature of all qualities other than those linked to **extension and movement**, of all **"secondary" qualities**, or if it were possible to reduce these to the former, geometry would suffice to make us know all the secrets of nature. To reduce nature to extension, to reduce physics to geometry, the idea was in the air: before Galileo, it had haunted Bruno. To reform physics so that all that remains is a geometry, to reduce that geometry to algebra, this double preoccupation is expressed in the *Regulae* which Descartes wrote down amidst many travels.

These *Regulae* contain, presented with admirable force and verve, the program of this ***mathesis***, of this unique science in which all particular sciences would be absorbed, all being governed by an identical method, based on the sole idea of **order** which prescribes that the data of any problem be arranged in a sequence analogous to that which, in a geometric progression, allows one to pass from one term to the next by a continuous movement of the mind. This is the method of mathematics. These proceed from the intellect alone; they mark its spontaneous deployment, its continuous progression starting from an initial relationship conceived in a simple act of **intuition**, which is defined as follows:

"By **intuition** I mean, not the changing testimony of the senses or the deceptive judgment of an imagination that improperly composes its subject, but the conception of a pure and attentive mind, a conception so easy and so distinct that no doubt remains about what we comprehend; or, which is the same thing, the firm conception of a pure and attentive mind, which arises from the **sole light of reason**." (Reg. III)

All knowledge is **"mathematical"**: this is what makes it valid. This is why Physics will be reduced to geometry, while geometry waits to be reduced to algebra. — When Descartes says that everything must be reduced to **quantity**, or to **extension**, it must be known that the latter appears in his work with a double meaning, or, so to speak, at 2 degrees. It refers sometimes to **spatial magnitude**, and sometimes to magnitude synonymous with **relation** and...