Introductory remarks at the inauguration of the Jacques Loeb Centre for the History and Philosophy of the Life Sciences

Ute Deichmann

The physicist and novelist C. P. Snow, speaking about contemporary biology in his influential "The Two Cultures", predicted in the early 1960s: "This branch of science is likely to affect the way in which men think of themselves more profoundly than any scientific advance since Darwin's – and probably more so than Darwin's."

Science is the most dominant feature of our times. The life sciences, in particular, have been developing as never before, with enormous impacts on our lives. The establishment of the National Institute of Biotechnology in the Negev is just an example of this development. At the same time, public criticism of science and an awareness of real and possible dangers and negative impacts on society as a whole have grown tremendously. For this reason, several leading life science research institutions, such as the Human Genome Research Institute in the US and the European Molecular Biology Organisation with headquarters and Laboratory (EMBL) in Germany, have established programmes related to the public understanding and ethics of science. The growing public scepticism towards science correlates with a growing attitude of relativism among commentators of science – philosophers, historians, and sociologists. Many of them deny that science provides a privileged form of knowledge. Instead they claim that science is no more than a social construct that is not basically different from other forms of social activity.

Where do we, the new Jacques Loeb Centre place ourselves in all this? Such a question can best be answered by taking a look at Jacques Loeb and his

scientific biography. At the outset, I should like to make one thing quite clear: Jacques Loeb (1859-1924) is not the benefactor of our centre. He was a German-Jewish, later American scientist, born almost 150 years ago, about whom his colleague at the Rockefeller Institute in New York, the chemist Phoebus Levene, asked himself: "Jacques Loeb, savant, philosopher, mechanist, satirist, rebel, crusader, humanitarian – about whom shall I write these lines?" Albert Einstein characterised Loeb as (my translation): "one of the most accomplished and most wonderful men that I have had the luck to get to know ... The few hours that I spent with him in New York and Washington, belong to the most precious and happiest recollections of my life. It was wonderful when he talked about the development of his thoughts and work which have influenced science so strongly, and when he talked about human and political things, fervently and resignedly (feurig und resigniert) together."

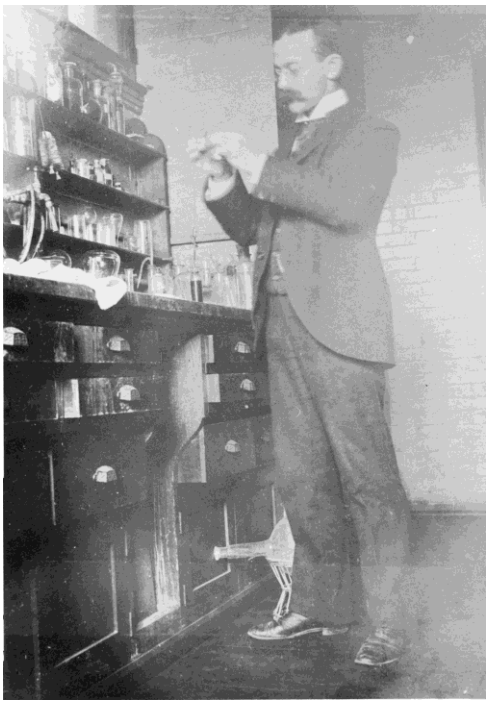
Loeb was born at the small town Mayen in west Germany. When his parents, merchants, observant Jews and politically very liberal, died early, his uncle Harry Bresslau, a renowned historian at the University of Berlin helped him receive a good high school and university education in Berlin.

Askanisches Gymnasium, Berlin 1877

Figure 1. Askanische Gymnasium, "In Memory of the Summer Semester, 1877." Isaak [Jacques] Loeb, center front. (Library of Congress)

Interested in philosophy early on, reading e.g. Spinoza, Kant and Schopenhauer, Loeb began to study philosophy at the University of Berlin. However, his first experiences here left him disappointed and convinced him that professors of philosophy were wordmongers, who neither could nor would make any real progress toward solving the problems they so delighted in posing. He shifted to medicine, which he studied, as was usual in Germany at the time, at various universities, in Berlin, Munich and Strasbourg, and specialised in physiology. He believed that he had no professional future in Germany, since his work was outside mainstream physiology, and he had not kept up personal contacts with the professors. Moreover, the fact that he was Jewish and an outspoken democrat – he "could not live in a regime of oppression such as Bismarck had created" – drastically reduced his chances of gaining a professorship. After working in several non-tenured positions, he immigrated to the US in 1891. There he was successful; he occupied positions at Bryn Mawr, Chicago, Berkeley, and, from 1910, at the Rockefeller Institute for Medical Research in New York, with summers spent in the marine laboratories at Pacific Grove or Woods Hole.

Bryn Mawr,1891



Woods Hole,1892

There are three major reasons why our centre carries Loeb's name.

1. Science and philosophy

Loeb was one of the legendary experimentalists and seminal thinkers in the history of biology. His passionate promotion of biology as an exact experimental science had a major impact on the development of the life sciences, where he strongly influenced the work of leading figures such as biochemist Otto Warburg, geneticists Thomas Hunt Morgan and Hermann Muller, and behavioural scientist Herbert S. Jennings. Loeb came to symbolise the appeal of a pure experimental science among physiologists and biologists in the US. This was also taken up in art: Literature Nobel Laureate Sinclair Lewis used him as a model for his protagonist Max Gottlieb in the novel *Arrowsmith*.

Loeb was convinced that science is able to provide secure knowledge and related this to its methods. Thus in 1915, when most biological and medical theories were still qualitative or speculative, Loeb furthered a quantitative approach to progress. Succinctly and elegantly he wrote: "If the agreement between observed and expected facts is not only qualitative but also numerically correct, the probability of an accident becomes comparatively small. The more closely the calculated and observed values agree, the smaller the probability that the theory was wrong. And if entirely different methods lead to the same quantitative values, the probability of correctness approaches absolute truth." As an outstanding example, Loeb drew attention to the calculation of almost exactly the same value of Avogadro's number by four scientists who each independently adopted different methods. Philosophers of science would call this the miracle argument against relativism.

The experimental life sciences of the past and present and the examination of scientific progress will be a focus of the work of our centre.

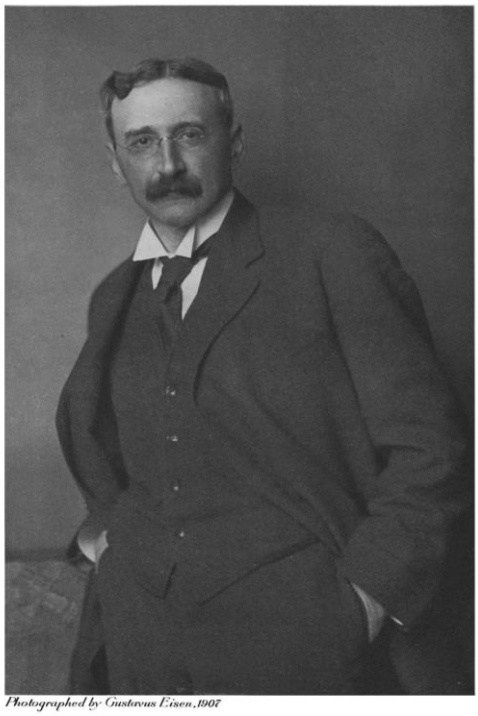
2. Multidisciplinarity

Loeb gradually shifted from physiology to experimental embryology, where, shortly after his emigration to the US, he conducted his most famous experiment, i.e. artificial parthenogenesis in sea urchins.

U. California Yearbook, 1905

Figure 11. An illustration from the University of California yearbook, *The 1905 Blue and Gold*, p. 564. One of a series entitled, "The University's Exhibits at the St. Louis Exposition, Continued." It was captioned: "EXHIBIT 13—This group is entitled 'Genesis.' It effectually refutes the biblical legend of the Garden of Eden, and proves that man is descended from a grain of common salt (NaCl). The figure on the right represents an antediluvian Knockers Club; the central figure is a correct imitation of a prehistoric bat. The sweet-faced picture in the lower foreground is that of Dr. Loeb. All the people in the cage call him 'papa,' and he seems to like it. Dr. Loeb will accompany his family to St. Louis and deliver his

LOEB 1907



Photographed by Gustavus Eisen, 1907

From there he moved to biochemical questions and was one of the first scientists to conduct fruitful research in biochemical genetics, anticipating that genes acted via the production of enzymes. At home also in the worlds of chemistry and physics, and mastering higher mathematics, he became a pioneer in the physical chemistry of proteins.

Though his reaction to lectures in philosophy in Berlin dissuaded him from studying philosophy, Loeb took a deep interest in philosophical and political issues and did not avoid major disputes, for example with his uncle Harry Bresslau, who like the majority of his colleagues in Germany defended the

German invasion of Belgium in 1914 and accused Loeb of having adopted the American standpoint.

As his voluminous correspondence shows, Loeb was in contact with major figures of science, philosophy, and history. Apart from his friendship with Einstein, he corresponded extensively with the physical chemist Svante Arrhenius, the biochemist Leonor Michaelis, and the physicist and philosopher Ernst Mach, who in the early years of Loeb's career had a major influence on the orientation of his work – the engineering ideal in biology – but whose anti-mechanistic and anti-atomistic opinions Loeb later rejected. Mathematician and historian of science George Sarton thought highly of Loeb, and made a point of inviting him to contribute to his newly founded history of science journal ISIS.

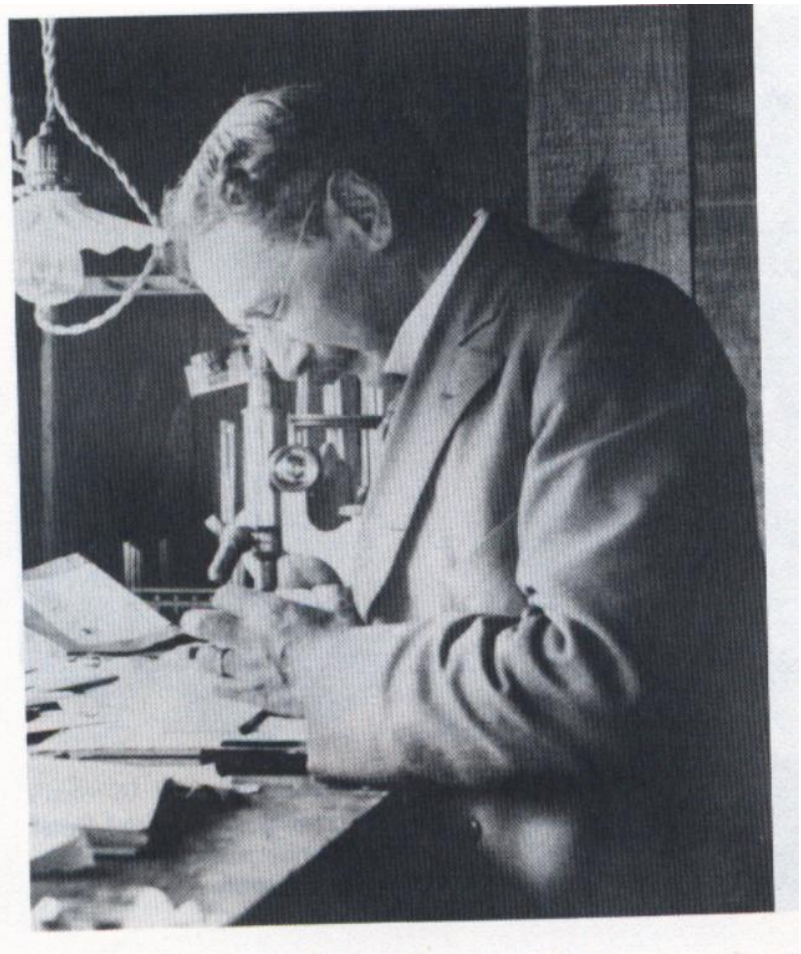
Our aim is to facilitate multidisciplinary exchange, an exchange between the east, west and south of this campus. We think that this may not only be very interesting, but also fruitful, for both, scholars and scientists. As Eric Davidson, embryologist at California Institute of Technology, recently wrote: "Conceptual advance, and conceptual history, can never truly be separated."

3. Politics and ideology

Since he lived at the turn of the 20th century, Loeb was not yet concerned with dangers generated by science and its applications. Instead, for him scientific reasoning as rational reasoning was the only effective weapon against irrational political currents, such as the chauvinist and antisemitic propaganda put out by the German scholars Dühring and Treitschke. Loeb was a humanist. His parents had instilled in him a love for the liberal values of the French Encyclopaedists such as Diderot. Throughout his life he fought against racism and nationalism, and for democracy and justice. He was greatly disturbed by the events of the First World War and in particular by the attitudes of racial and national

superiority primarily of the German elite but also elsewhere in Europe. In these times, science became also a resort for him.

Loeb at work in the evening



After that war he supported German colleagues by organising funding and helping them receive positions in the US. Appalled by the suppression and persecution of Jews in Russia, he supported the activities of Zionists, and served as an advisor for the development of science-related institutions in Palestine. Approached by the Zionist leader Judah Magnes, he tried to raise funds for the agricultural school and the hygienic department in Haifa. Though he was not successful, Loeb's letter to Magnes is telling (20. Feb. 1913): "… my whole experience in life has taught me … that nothing less than the fullest possession of knowledge is adequate even in the most casual enterprises."

Our centre will also examine the relationship of science and scientists with politics and ideologies.

I have been frequently asked: why do we create a centre only for the life sciences?
The answer is simply that we are a small centre and as such have decided to start with a sharp focus. This appears to be the best way to create something like a critical mass in our adopted field. Moreover, life sciences today include other sciences, such as chemistry, physics, and crystallography, as a review of the professional backgrounds of "life scientists" shows. With its focus on modern experimental life sciences, the centre will not only be a novel institution in Israeli academia but also in a broader international scene. The Cohn Institute in Tel Aviv, the Edelstein Center in Jerusalem and the programme at Bar Ilan University are larger and have a much broader approach. But we will grow also, whatever mutations and selection processes will shape the growth.
As a research centre, the Jacques Loeb Centre cannot provide regular programmes of teaching. But we do organise workshops, bring guest lecturers, and offer post-doctoral and other graduate fellowships in the history and philosophy of science.

I would like to convey my thanks to BGU administration for fast handling the several bureaucratic steps and to President Rivka Carmi's and Rector Jimmy Weinblatt's tremendous support. I also thank everybody for coming and celebrating this event, particularly those colleagues who came from abroad to join us at this inauguration.