Otto Loewi on his 80th birthday.
Photo by Trude Fleischmann.
I was introduced to Otto Loewi in Vienna in 1958, at the end of the Opening Ceremony of the 4th International Congress of Biochemistry, of which Loewi was Honorary President. He invited me to see him the next morning at the Hotel Regina (F.L). I did not expect him to keep me sitting at his side the whole morning, during which he was frequently interrupted by journalists and others wishing to welcome him. He wanted to know every detail about my research work. He told me many details about his experiments, and when I expressed admiration for his memory, he replied, ‘The memory is a function of the interest’ and added that he had not even retained copies of his own papers. I politely answered that I would try to collect all his publications. I did not expect to fulfill this promise until after my move to Tübingen. Eventually with the collaboration of the student Wolfgang Giere the book Otto Loewi: Ein Lebensbild in Dokumenten was published.

Loewi’s life is documented by his autobiographic sketch published in 1960 (see pp. 11–29).

Henry H. Dale’s obituary of Otto Loewi that had been published in the Biographical Memoirs of the Fellows of the Royal Society in 1962 (see pp. 30–53) one year after Loewi’s death contains a complete bibliography. Giere and I had not been aware of this publication, since it had been distributed only to members of the Royal Society.

One year before he died Franz Brücke, Head of the Department of Pharmacology of the University of Vienna, contributed his recollections of Otto Loewi to a series covering Austrian Nobel Prize winners (see pp. 54–67). He described the years he spent with him in Graz, including stories about life in Vienna in those times and concluded with a poem by Otto Mayerhofer expressing an idea with which Loewi identified.

Stephan W. Kuffler’s recollections, not reproduced in this book, reflect the warm feelings of a close friend of Otto and Guida Loewi, and focus particularly on the summer days spent in his beloved Marine Biological Station at Woods Hole, where Loewi felt truly at home and in his element. He was often seen sitting in the library, talking to young researchers [Lembeck and Giere, 1968, picture on p. 192]. Throughout his life Loewi took up every challenge with enthusiasm. Three episodes illustrate this aspect of his personality.

Archives in Strasbourg

When Professor Oswald Schmiedeberg provided Otto Loewi, then a freshman at the Department in Strasbourg, with details about an experiment he should perform, he concluded by saying that Loewi should look for further details in an article in volume 6 of the ‘Archiv’. Schmiedeberg meant the Archiv für experimentelle Pathologie und Pharmakologie, which he had started jointly with the pathologist Klebs (Prague) and the clinician Naunyn (Königsberg) in 1873. As Loewi did not find the ‘Archiv’ in the laboratory he went to the City Library.
librarian was rather surprised and said that he could examine the requested volume only within the library. He returned with a large leather-bound volume, the archive of the City of Strasbourg from some time early in the 14th century. Loewi concluded that there had to be another ‘Archiv’ somewhere.

In the early years in pharmacology Otto Loewi became enthusiastic about some new findings in biochemistry. One of the consequences of this enthusiasm is described below.

‘No, and Now You Leave Me Alone’ Said the Professor to the 27-Year-Old Doctor

This event happened at one o’clock at night before beginning a series of experiments which resulted in the publication by O. Loewi: Über die Eiweisssynthese im Thierkörper [from Lembeck and Giere, 1968, pp. 84–85].

‘As outstanding contributions I consider in the first place those which opened up new important fields of established methods which made possible such progress. Among the many papers of mine dealing with metabolism is one which quite generally has been considered as coming up to the definition of “outstanding” as just given. That paper was on “Protein Synthesis in the Animal Body” published in 1902.

Up to that time no one had succeeded in maintaining animals by feeding them in place of native proteins with the products of their degradation, even if the degradation had not gone very far. It looked therefore as if animals were not able to synthesise their own proteins from the degradation products. I knew of course about this state of knowledge. I was however not especially interested in that question. This state of mind, all of a sudden, was remarkably changed. One evening it happened that I read a paper just published by Friedrich Kutscher who was the biochemist at Marburg, my University. In that paper Kutscher showed that by long lasting incubation of an organ – he used the pancreas under antiseptic conditions at 35° – the proteins are decomposed to such a degree that there is no longer present any reaction characteristic of proteins. At once I got the idea and the firm conviction that I would succeed, by feeding, as the only nitrogen carriers, such degradation products of the whole organ, in reaching a protein synthesis in animals. If anybody would have asked me why I was so firmly convinced of the eventual success of such an experiment after all the negative experiments of the past, I could not have given any answer. I was so excited that, when I went to bed that night, I was unable to find any sleep. At one o’clock in the morning I got up again to make immediately sure whether Kutscher did not himself wish to perform these experiments. He was, of course, already asleep. I remember very well how he berated me for my brainstorm. Without opening the door, he yelled at me: “No, and now leave me alone.” My project seemed so important to me that early next morning I sent my boss to him to verify that he really did not intend to work it out. His answer was: “I don’t care whatever this fool does, who wakes up decent people after midnight.”

I started the experiments at once. For a very long time I encountered the greatest difficulties, mostly because the dogs did not relish the unusual food, which in fact was not very appetizing. I am pretty sure that many others would have been discouraged and would have given up. I, however, had such strong faith in final success that I persisted. This was rewarded, as eventually I overcame all the difficulties and was able to prove the correctness of my hunch that animals are able to rebuild their proteins from amino-acids, their final degradation products. In fact, total degradation within the intestine has since been shown to be the normal fate of fed protein. From that time to the present day this discovery has proved to be of great importance for the science and practice of nutrition. At the time I made the discovery, I did not at all foresee such dividends, which happens often. It reminds me of a well-known saying of Benjamin Franklin. He was witnessing the

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first demonstration of a purely scientific discovery and people around him asked, “but what is the use of it?” Franklin answered: “What is the use of a new-born child?”

My discovery was soon verified by other scientists; it caused considerable commotion and helped me to establish me as a researcher."

Comment on Otto Loewi’s Work

Pharmacology did not initially attract his interest. And yet, he asked the famous Father of Pharmacology, Professor Oswald Schmiedeberg in Strasbourg, for a subject for his thesis. As a rule, people working in Schmiedeberg’s laboratory were apprentices or competent scientists from all over the world; rarely students who had no preliminary knowledge or training.

When Loewi was appointed to the Chair of Pharmacology in Graz in 1909, at the age of 34 years, he had already a high reputation among pharmacologists, which is illustrated by a few examples. His Inaugural Lecture on January 25, 1909, had the title ‘Pharmacology and Clinic’, which was presumably his intention at that time, but was followed by experimental work mainly in the field of physiology.

In his publications about diuresis, he found that the caffeine-evoked diuresis is explained by a vasodilator action on renal vessels (1905). Jointly with A. Fröhlich (1908, 1910) he discovered that following an injection of cocaine at a dose without an effect on its own, the subsequent effects of adrenaline on blood pressure, urinary bladder relaxation, salivary secretion and pupillary dilatation are potentiated; they found this about 50 years before the description of the mode of action of cocaine by Muscholl [1961].

In his initial years in Graz, before the series of 14 publications about neurotransmission between 1921 and 1930 started, he investigated together with Konschegg (1913–1918) the relation between the cardiac effects of digitalis and the calcium concentration on the isolated frog heart. Loewi wrote: ‘With the fact that strophanthin causes a sensibilization for calcium, the question concerning its action is certainly not solved but narrowed; it means now: what is the mode of action of strophanthin by which the heart becomes more sensitive to calcium? ’ This finding has been confirmed by numerous experimental and clinical studies [reviewed by Repke, 1964].

As a professor in Graz, Loewi delivered carefully prepared lectures every day for 30 weeks of the year. At that time there was a rather limited number of medical students, who all had to be examined by him. This left him sufficient time for research under the rather limited circumstances in the poorly equipped laboratory. From his home he had to walk for 5 minutes to the department. Occasionally he took a co-worker on a walk up to the Castle Hill. But since cars were not common at the time further excursions to the surroundings of Graz were rare.

The ‘Napoleon Ash Tree’ in the Garden

In the following I would like to mention an example of Loewi’s historical awareness and his sense of humour. Close to the corner of the property on which Loewi built his ‘Villa’ there was a large ash tree under which Napoleon I stood in 1782 to observe his troops marching by. Loewi bought the small piece of land to preserve the historical tree. In the years 1810–1813 Louis Napoleon owned the neighbouring man- sion which still exists; he was displaced to Graz by his brother Napoleon I. He enjoyed staying there and wrote:

‘La ville des grâces au bord de l’amour’, which might be translated as:
‘A city of beauties ready for love’, and which in German sounds like:
‘The city of Graz on the bank of the river Mur’.

An event like this contributed to Loewi feeling happy in his environment.
All this came to an abrupt end in 1938.
Another Spontaneous Reaction

Another spontaneous reaction, typical of Loewi, occurred on April 30, 1954. He had received the following cable: ‘I have the honour to inform you of your election today as Foreign Member of the Royal Society. Hinshelwood, Foreign Secretary Royal Society.’ On the same day he sent a note to his son Guido:

‘Now a word became true: wishes in the youth – one receives with richness in the age. Such an honour does not take the second place after the Nobel Prize Award, with consideration that the number of Foreign Members of the Royal Society is limited to 50.’

References