



The inventor of electroencephalography (EEG): Hans Berger (1873–1941)

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Introduction

German psychiatrist Hans Berger (Fig. 1) was born on 21 May 1873 in the town of Neuses near Coburg, in southern Germany [1, 2]. To become an astronomer in 1892, he enrolled at the Friedrich Schiller University of Jena as a mathematics student. He left after one semester and served in the army for 1 year as a cavalry. He was injured by falling from his horse during a training. Meanwhile, his sister, who was miles away from Berger, felt that he was in bad condition and she sent an urgent telegram. Berger then considered this is a telepathic communication. Therefore, Berger had a desire to study psychiatry [2, 3]. After receiving the degree of Doctor of Medicine at the University of Jena in 1897, he began working as an assistant to Otto Ludwig Binswanger (1852–1929), who served on the department of psychiatry and neurology at the Jena clinic [3]. Berger became the head of this clinic in 1919 [1].

When Berger, who was very shy and had poor social relations, returned to Germany, he encountered various

difficulties. He committed suicide on 1 June 1941 as a result of severe depression [1, 3].

The discovery of EEG

Berger's incident led him to explore the physiological basis of psychic events. However, the results were not as expected. He began researching the brain's electrical activity. Berger's son Klaus and daughter Ilse became subject in all his work [1]. Berger previously recorded brainwaves by injecting Novocaine into the scalp and placing the electrode in the periosteum [3]. He recorded his first EEG on July 6, 1924, on a 17-year-old boy during a neurosurgery performed by neurosurgeon Nikolai Guleke (1878–1958) [1, 4]. In later periods, he developed a recording technique, connecting the electrode to the scalp as it is now done, and he was the first person to record as non-invasive the electrical activity of the human brain [1]. In 1929, he published his first paper on EEG, "Über das Elektrenkephalogramm des Menschen," using the terms alpha and beta waves (the alpha waves also known as Berger wave) [3, 5]. In this article, Berger examined the EEG recordings of patients who was different ages and genders (Fig. 2 and Cover) [5, 6]. With his studies, Berger recorded that brainwaves change during a mental activity and during sleep. He also observed that there were different electrical waves around the tumor [3].

Conclusion

Today, EEG is known as an important method routinely used in diagnosis of diseases in many fields such as neurology and psychiatry. Hans Berger should be commended for this important discovery.

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Fig. 1 Hans Berger which can be found at https://en.wikipedia.org/wiki/Hans_Berger[05.02.2020]

Compliance with ethical standards

Conflict of interest The authors declare that they have no conflict of interest.

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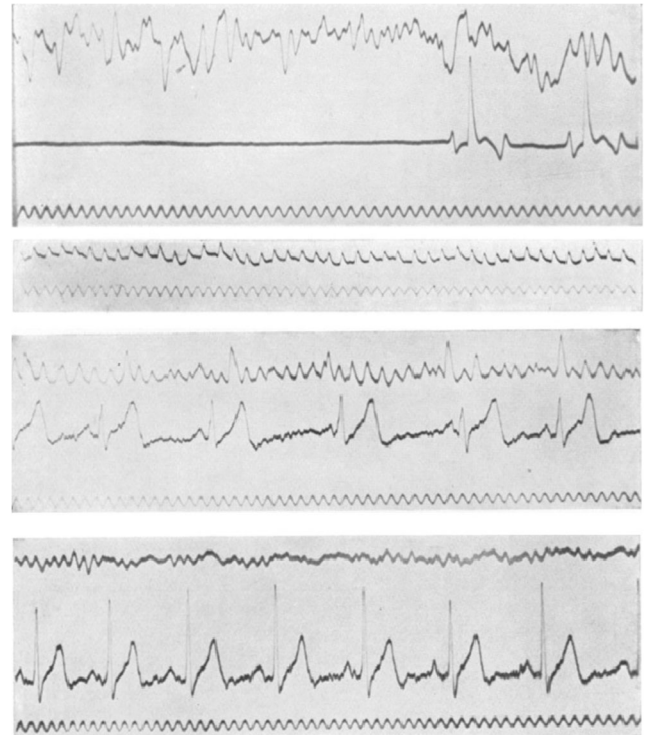


Fig. 2 and Cover. Examples of EEG that Hans Berger recorded from patients of different genders and ages in his paper *Über das elektroencephalogramm des menschen*

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