

## Food at the International Hygiene Exhibition, Dresden, 1911.

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The German Hygiene Exhibition in Dresden, in 1911, emphasized the importance of food, hygiene, and health to the human body. Its presentation of all the newest scientific findings at the time about modern food hygiene, food preparation, and the food industry was of great public interest. A highlight showed the digestion of food in a transparent human body. This Research Note identifies the rich food and nutrition information to be found in the interrelated sections, events, and literature of this exhibition. It also conveys an international sense of the historical development of scientific inquiry and exposition on these research areas.

### The International Hygiene Exhibition, Dresden

The “International Hygiene Exposition” (IHE) took place in Dresden, Germany, from May 6 until October 31, 1911. With 5.5 million visitors, it was the best-attended exposition ever held in Dresden. Located in the urban exposition palace built in 1896, the exhibition was the idea of Karl-August Lingner (1861-1916), the successful German manufacturer of Odol mouthwash. Lingner, who had developed and sold hygienic articles since 1892, felt himself responsible for public health education. In 1908, the Verein zur Veranstaltung der Internationalen Hygiene-Ausstellung (“Association for Preparation of the International Hygiene Exposition”) was founded. Two years later a poster competition was organized. After a young and not yet popular poster artist, Wilhelm Petzhold, won, Lingner asked a well-known poster artist from Munich, Franz von Stuck, to create a proper poster using Petzhold’s design motif. Von Stuck’s exposition poster was such a success that its “awake eye” became a symbol for hygienic questions.



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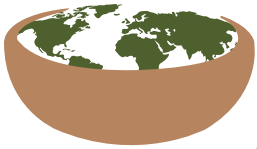
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Eleven countries had convened at the technical university to plan the details of the hygiene exposition. The exposition's catalog shows that the many topics discussed included the quality of food, mineral water, sports, German health insurance for workers, infectious diseases, tropical diseases, the human and foreign department for health, and a range of other food topics (IHE 1911). Lingner was also elected director of the exposition. He believed that "Die Hygiene ist die Lehre von der Erhaltung und Pflege der menschlichen Gesundheit, die Lehre von der Erhaltung des menschlichen Wohlbefindens" ("hygiene is the instruction to preserve and to take care of human health, the instruction to preserve human well-being"). His intention for the exposition was to give the public advice on how to keep healthy. To develop health awareness and to teach hygienic education to the general public were his specific aims.

Hygienic topics were very relevant for people in Germany at the end of the 19th century and at the beginning of the 20th century because of the unhygienic living conditions found in urban communities. Those like Lingner felt that the rise of tuberculosis, skin and venereal diseases, and the low quality of food made a public hygiene exposition necessary. The exposition had significant support from reform movements (Siedlungs- und Gartenstadtbewegung). For example, it became a vehicle for the promotion of ideas about urban development. Advocates called for the construction of green housing estates with lots of light that contrasted to the unhealthy living conditions found in the big and overpopulated cities. Although the exposition led to improvements, such as the creation of a department for disinfection and the construction of central slaughterhouses, it did not result in the creation of a hygiene museum in Dresden as Lingner planned. It was an objective that he was unable to realize before his relatively early death in 1916.

## The Early Beginnings of the International Hygiene Exhibition in Dresden

The IHE was part of a series of public initiatives in Germany around public hygiene education that dated back to 1871 when a chair for hygiene was founded. Six



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years later a chemical center for health service was opened, in 1878 a chair for hygiene at the Saxon University in Leipzig followed, and the idea of opening a hygiene museum in Dresden was introduced in 1880. The huge success of a general German hygiene exhibition in 1883 in Berlin sparked the idea to do the same in Dresden and to open a permanent hygiene museum there. In 1883 the Saxon government discussed this proposal but with no result (Poser 1998:140).

Not until 1903 was the idea of an International Hygiene Exhibition in Dresden born, which Lingner initiated by organizing an exhibition pavilion on the topic of widespread diseases and their treatment (IHE 1908:31). The success of this exhibition pavilion with 220,000 visitors showed that there was widespread public interest in hygiene. For the next several years this pavilion was shown in many German towns including Frankfurt am Main (1904), Munich (1905), and Kiel (1906). Later it was integrated into the general IHE in Dresden (IHE 1910:19).

## The Content of the International Hygiene Exhibition in Dresden

The IHE in Dresden addressed 50 different topics that were subdivided into popular, scientific, historical, industrial and literary departments. Also included were special exhibitions organized by external organizations and associations. For example, ten European and non-European countries presented on the state of the development of their hygiene. The exhibition programme of 1908 refers to literature on different topics covered and indicates that public lectures about the special exhibitions were also given. As a kind of climax, the IHE organized live demonstrations on the good influence of sports on human health (IHE 1908:37).

The industrial department was the biggest section of the IHE and it demonstrated an interest in technical hygiene research (IHE 1911:81). Many companies showed their new products there. The popular department, with its “human body and its organs,” was the darling of the public. This exhibit of a glassy human body remained one of the most famous parts in the later hygiene museum. The following topics were addressed in the industrial section: the basics of life shown by microorganisms, cells



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and cell division, the human body and its organs, personal hygiene, apartment and settlement, human bodies shown at different life stages, widespread diseases and their treatments and occupational hygiene. These departments taught basic biological and medical knowledge and stressed the benefits of the health service.

The scientific department gave a systematic overview of hygiene knowledge (IHE 1911). The 43 topics covered included illnesses, vaccinations, disinfection, control of epidemics and statistics, air and sunlight, balneology (the therapeutic use of natural healing springs), meteorology and climatology, baby and youth care, school hygiene, occupation and work, technology and machines. Next to jobs and work, illnesses were at the center of the IHE. In the occupation and work section, occupational statistics, occupational hygiene, the chemical industry, and health and safety regulations at work were also important topics. Nutrition, a topic I will turn to in more depth shortly, was also covered.

The historical department presented the history of hygiene from prehistory until modern times, including hygiene in primitive societies. The Roman Empire seemed to be exemplary. The historical-genetic development of hygiene was also described in modern times up to the present. IHE displays were based on original materials, models and realistic representations (IHE1908:7).

The division of the exhibition space into departments served to appeal to different audiences, and the broad range of topics covered attracted a wide audience. The industrial department was aimed at entrepreneurs and factory owners while the popular and ethnographic department was intended for everybody. The scientific department for scientists, medical doctors, and civil servants was designed to give them the newest information about hygiene. On each floor there



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were special signs to direct visitors to the appropriate section.

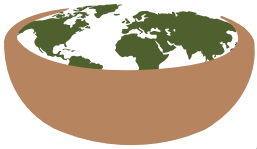
The IHE succeeded in attracting 5.5 million people from May to October 1911, more than the 4 million who attended the International Health Exhibition in London (Poser 1998:147). Civil servants on business trips and members of many societies and clubs were invited to increase the number of visitors. During the exhibition, around 400 national and international conventions took place in Dresden (Poser 1998:147).

## Preparation and Realization of the IHE

Organizers of the IHE had two main aims: to promote improved hygiene among the general population and to clearly show the newest findings in the area of hygiene. Lingner, the initiator of the IHE and founder of the hygiene-museum in Dresden, identified the core problems of individual hygiene as baby care, nutrition and alcoholism. He believed that the exhibition would result in a more satisfied citizen in a good state of health and with a better standard of living:

The biggest goal, to awaken and strengthen the interest of citizens in their physical health and individual hygiene, should have the support of [the] state. The state had to invest millions of German marks into public health care, and this only will stop if citizens revise their hygienic rules and doctrines. If the exhibition is able to raise hygienic standards and to increase health awareness, the International Hygiene Exhibition of 1911 will fulfill one of the most important cultural tasks (IHE 1911:12).

The main catalog was a programme that gave a short overview



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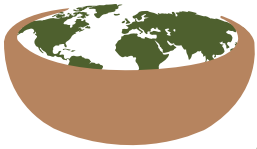
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about the exhibition's content. The subject matter was divided into 12 main groups according to scientific points of view. Within these groups there were subgroups that gave practical hygiene information and addressed legislation and social efforts concerning hygiene. The different groups were chaired by leading scientists, while honorary members were chosen from all nations. The first group talked about topics like air, sunlight, earth and water; the second group was responsible for apartments and settlement; and the third group, which interests us, focused on food.

## Nutrition and Food

The topic of nutrition and food was subdivided into modern dietetics under the chairmanship of the leading German food chemist Josef König; meat products under the leadership of the Director of the Veterinary Department of the Imperial Public Health Department, Berlin; dairy products under the chairmanship of the Director of the Hygienic Institute of the University of Strasbourg; and food research under the chairmanship of the Chemical-Hygienic Department of the Imperial Public Health Department, Berlin (IHE 1911:16).

Presented first of all was metabolism of the human body (body heat and organ function) while at rest and at work. Next were single food components like proteins, fats and carbohydrates as shown by their chemical properties, their heat of combustion (calories) and equivalent values. Their different influences on human metabolism were discussed, including the effects of water and nutritive salts. Addressed last were the nutritional needs required to fuel an adult body and to keep it fit and able to work. Topics included the use and good digestion of foodstuffs in relation to topics such as: quantity, volume, temperature and meals; the question of which diet would be best, whether vegetarian, meat-based, or a combination of vegetarian and meat-based; preparation of food and the effect of stimulant



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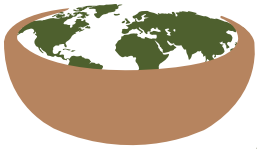
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foodstuffs; and the financial cost of food and nutrition for the masses.

There were common schemata to the subject of nutrition. Point B dealt with the subject of animal foodstuffs. It was stressed that when eating meat, its origin, structure and value should be known (animals for slaughter, venison, poultry, fish, crustaceans, and mussels). Questions were raised concerning the health risks of consuming meat: Were there substances in meat which could be harmful to health such as parasites or infectious diseases? It was recommended that damaged, low-quality, or falsified meat be identified (IHE 1911:31). To ensure good quality, stricter controls were advocated for slaughtering cattle, controlling the import and export of meat, and inspecting meat (including for trichina), meat markets, and butchers. Suggestions were made about what to do with inedible meat (how to refuse it and how to improve low quality meat), rules about what to do with low quality meat, how to handle slaughter benches, and the need for buildings and slaughterhouses to be regulated. Legislation concerning all aspects of meat preservation (minced meat; sausages; addition of preservatives; preservation by cold, heat, drying, salting, pickling, or smoking; animal fats, glue substances, beef extracts, and stock cubes) should be matters of public discussion.

Keeping eggs fresh was very important because they were seen as meat for the poor. Because eggs and milk were cheap animal proteins for workers, dairy farming and dairy products were a focus of the exhibition. Besides milk, breeds, feeding, shearing time, seasons and other hygienic points were important topics. It was recommended that the milk trade and products not be negatively influenced by pollution with dirt or microorganisms coming from the animal itself or the surrounding animals in the stable. Stricter control of stables in the dairy and milk trade was demanded. It was argued that special physical, chemical and bacteriological methods be introduced to the milk trade in order to investigate milk and



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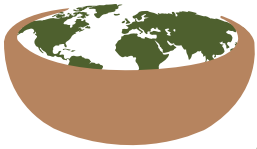
to find any bad substances in it. Pasteurization and the need to heat milk were a subject of discussion. Preservation additions, milk proofs and limits for canned milk were prescribed. Forms of long lasting milk like canned milk and powdered milk, as well as methods to preserve milk with the help of bacteria (like sour milk, yogurt, kefir or kumys) were introduced to the audience (IHE 1911:32). Cream and butter production, falsification, pollution, and spoilage, as well as substitutes such as margarine or artificial cheese, were a focus. In the end, new stricter food laws were proposed.

Vegetables, grains, and fruits comprised another main exhibition area. Here especially the composition of vegetables as foodstuffs was interesting. Different cereals made from rice, corn, millet and buckwheat were shown with the help of visual aids. Under the topic of wheat, different flours, grinds, sicknesses of wheat, and its substitutes were considered. The process of baking bread and the bread trade were dealt with intensively. The industrial production of sugar followed upon the extensive information given to the public about vegetables, potatoes, fruits, and dried fruits (IHE 1911:33).

Point D conveyed information about the meaning of coffee, tea, tobacco, cocoa, drinks and alcohol to human nutrition and their bad influences on our bodies. Photos and pictures illustrated spices, and especially the toxic influence of alcohol to the health of the human body. The focus on alcohol related directly to the big problem alcoholism posed in the period, particularly among the working class (IHE 1911:34).

Point E explained chemical, physical, microscopic, bacteriological analysis of foodstuffs and toxic substances. A special emphasis was placed on the nutritional law of May





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14, 1879, which prescribed the right packing material, colors, equipment, and containers for foodstuffs (IHE 1911:35).

Finally, the historical department gave an overview of all items of personal hygiene (nutrition, clothing, cleaning of the body, sports, and work). It covered topics such as new and older forms of food, famine foods, drinks, intoxicants and spices, eating habits, meals, cutlery, dinner service, cult food, seasonal meals, artificial foodstuffs, diets, and food trade.

## The Special Catalog for the Nutrition Group

The part of the IHE devoted to nutrition fell under the leadership of three chairmen, Joseph König, who was Professor at the Imperial University and Director of the Agricultural Experimental Institute in Münster; Professor Adolf, Director of the Medical Clinic Halle an der Saale; and Emil Abderhalden, famous Professor and Director of the Physiological Institute of the Veterinary University, Berlin.

Metabolism in animals and plants was illustrated in Point I of the exhibition:

We start with the plants and follow the building of many metabolism products on the basis of the same chemical elements. All these substances are eaten by animals and become essential combinations in the cells, organs and finally build the body of animals. . . . The comparison of single physical elements gives us an impression of the processes of metabolism in single cells. We follow this metabolism process starting with its origin in the plant, over the transformation in the animal body, step by step, to its metabolism as end products. . . . We would like to know in which quantity, and under which circumstances, single foodstuffs are needed.



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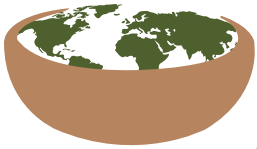
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Human and animal excrement gives information about the input and output of foodstuffs. By this method we can determine exactly the kind and quantity of food bodies require. Special appliances help to analyze this excrement and others help to give us precise information about the gaseous input (oxygen) and output of carbonic acid (gas metabolism)” (König, Schmidt, and Abderhalden 1911:5).

The plant accumulates sunlight in form of energy, which it needs to build up new plant cells. This energy will be free, again, when the cell metabolism of animals burns it during work or producing body heat. Here the energy in terms of the nutrition received was compared with the delivered energy, so that the metabolism of energy could be determined exactly with the calorimeter (König, Schmidt, and Abderhalden 1911:6).

Then the description became very scientific and difficult for everybody to understand.

The nutritional and financial value of foodstuffs was the second point of view that had to do with plants. It said: “The cheapest vegetable is the potato. The . . . use of animal food is much better than the one of plants, while vegetables are much cheaper than meat” (König, Schmidt, and Abderhalden 1911:11). It was demonstrated how many grams of water, protein, fat, and carbohydrate were in one kilogram of beef, fish, eggs, milk, or cheese. The cheapest food was determined to be milk. The food intake required by an adult, who weighs 70 kilograms (or approximately 155 pounds), at work and rest, was provided and illustrated. Changes were noted by age, including how fat was most needed in the first stages of a human’s life. The different influences on human metabolism of elements such as temperature



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and carbon and steam secretion were a focus of research. The 13 food tables that followed included one for dairy products, another for eggs and cheese, another for meat (fresh, pickled or smoked), and so forth. A comparison between the nutritional value of food and alcohol showed that alcohol really was not nourishment for the human body (König, Schmidt, and Abderhalden 1911:13).

Point III exhibited the secrets of digestion in bottles. Point IV showed moulages of a meat diet, a vegetable diet, a mixed diet, a milk diet, and related excrement. Point V showed three tables by Professor Albertoni from Bologna, which illustrated the influence of egg, meat, and wine consumption on the metabolism of vegetarian Italian farmers. The influence of fish consumption in the meals was visible in three other tables. Point VII showed in a schemata how digestion functioned in a human body, and Point VIII provided digested examples of raw vegetables, bread, and meat, with digestion secretions in bottles. A mock up of the diet kitchen in the Imperial Clinic in Halle an der Saale showed the stomach, intestines, metabolism, and kidneys of sick people.

In addition to the general catalog for nutrition, there were many special catalogs. The special meat supply catalog of the scientific department of the IHE traced the origins of the production of meat. Further it gave a definition, ingredients, and nutritional value of meat (Illing 1911). The priority of meat, or the answer to the social meat question, was at the center of the exhibition discussion:

Meat is one of the most important foodstuffs, and humans, who mainly live on the consumption of strong and well prepared meat, demonstrate their better health by a better physique and condition. There is no scientific doubt about it that the everyday



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experience and . . . the longer lasting resistance against bad influences [bacteria, virus etc.] while consuming enough quantity of meat during special periods supports scientific findings. It is an hygiene problem and it should be a main goal that there is enough meat for everybody in the society (Illing 1911:13).

Because meat was basic to nutrition from the point of view of the scientists, they discussed how to achieve better quality and better value from meat. It was questioned if importing cheap meat from other countries should be allowed or if it would be better to rely on German meat and to improve its quality by stricter controls and laws.

The special catalog on milk supply tried to connect the interests of the dairy industry with the interests of science and technology, in order to achieve a better quality of milk (Löhnis 1911). A special milk hygiene laboratory was installed to demonstrate new techniques of milk preservation. Milk and eggs were seen as the animal proteins of the poor (Löhnis 1911:7). There was an emphasis on the importance of milk and dairy quality controls.

The longest special catalog was about vegetables and the control of foodstuffs. First starches (cereals, wheat, bread, starch, and nutritive salt) were mentioned. Then fats, oils, sugar, honey, vegetables, mushrooms, and canned foods were discussed, followed by alcohol (beer, wine, spirits), spices, tea, coffee, cocoa, alcohol-free drinks, and fruit juices. Food control laboratories and special control instruments were to ensure quality. There was also a special library included on this topic (Pleißner 1911:6).



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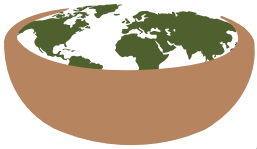
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## Conclusions

The goal of the IHE Dresden was to produce responsible citizens in the area of hygiene and living conditions. The newest scientific findings on the topic of hygiene were aimed at industry leaders while hygienic education targeted consumers. The exhibition called for improved hygienic standards in food production, imports, exports, packing, and transportation. These were to be enforced by better and stricter controls of foodstuffs and more stringent food laws.

The IHE was an attempt to solve social questions raised by conurbation, where formally separate suburbs, towns, and villages were merging into one large urban center. Organizers believed that public health would be improved by the newest hygienic findings. The 5.5 million visitors at IHE Dresden show how important this information was for the everyday person on the street. It also was intended as further training for civil servants. After the exhibition, exhibitors were asked to leave their tables, arrangements and demonstration objects there for use in the Hygiene Museum planned to be built later in Dresden.

In sum, the aims of the IHE were hygienic education of the population in an effort to help manage social problems as a result of industrialization, economic aid, demonstration of capacity, and state representation. In 1912, a “memorandum for the foundation of a Hygiene Museum,” which was based on a constitution of the “Association for a National Hygiene Museum” was produced. Two main aims were considered: hygienic education for everyone, and overview and information about the newest findings on the subject of hygiene. Many reports appeared in popular and scientific publications of this period indicating that the IHE in Dresden was a positive public success; the *Dresdner Nachrichten*, a Dresden newspaper, for example, emphasized how the IHE Dresden attendance

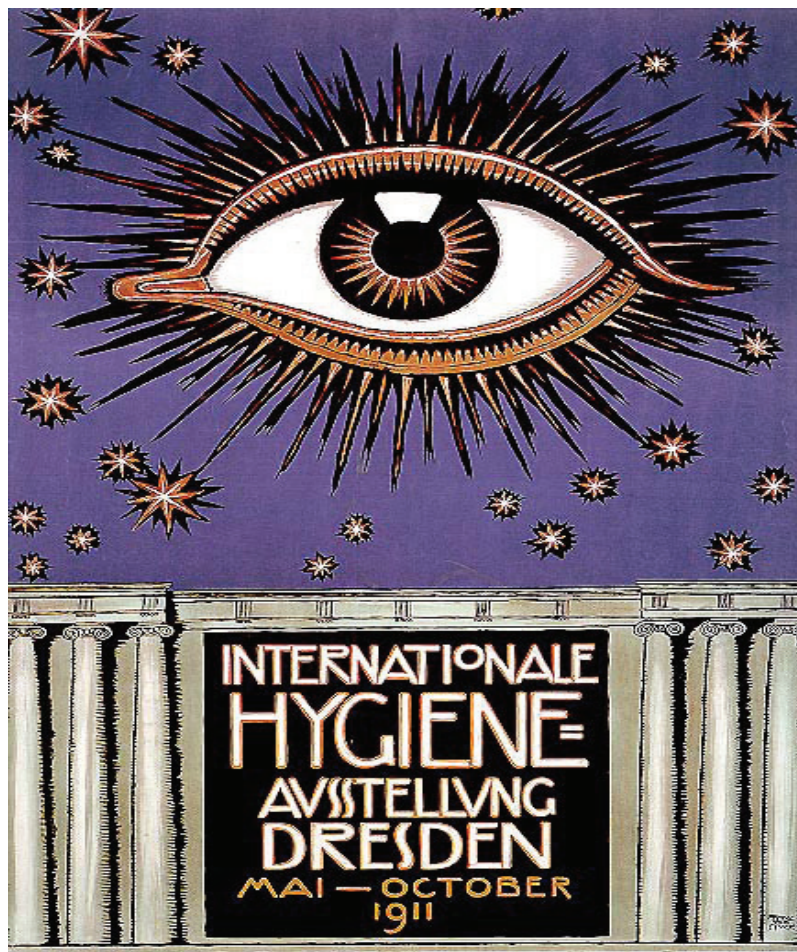


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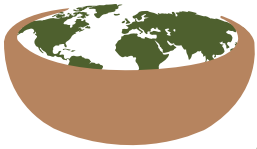
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beat the recent world exhibition held in Brussels. Only some social democrats criticized the IHE, claiming that it would change the bad circumstances and living standards of the working class. If the IHE Dresden really changed living standards in working class districts solely by teaching hygiene, however, remains another question.



Franz von Struck's poster design for the Internationale Hygiene-Ausstellung, Dresden, 1911, featuring the "Awake Eye" motif. This public domain image courtesy of Wikimedia CommonsHTML at [https://commons.wikimedia.org/wiki/File%3APlakat\\_v\\_Stuck11.jpg](https://commons.wikimedia.org/wiki/File%3APlakat_v_Stuck11.jpg) (access February 19, 2017).



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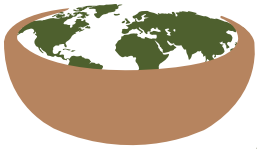
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## Notes

(1) Plans for the Hygiene Museum were interrupted by World War I and the sudden death of Lingner. After the war there was not enough money to build the museum; in 1930 only a few samples were left from the original IHE (Poser 1998:149).