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Defecating a Brick

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Abstract

This paper discusses the feasibility of the common colloquialism “s***ing a brick” by discussing the processes which would need to occur in the human body to allow the manufacture of a brick. The brick making process involves the mixing and compaction of ingredients, a moulding and drying process, and sometimes burning the brick. For a human, the mixing and compaction could occur in the stomach, and the moulding, drying and burning could occur externally, but the raw ingredients would not reach the moulding stage. It is concluded that the act of defecating a brick is not feasible for humans although faeces may in future be incorporated into the manufacture of traditional bricks.

Introduction

Whilst used as a phrase to indicate severe shock and fright, “s***ing a brick” is a term often used without regard for its physical implications. The aims of this paper are to describe and explain whether or not it is biologically possible for humans to imitate the brick manufacturing process.

Bricks are generally comprised of clay and sand but the use of organic matter is common throughout the world. Two major types of brick are fired bricks and adobe bricks. Fired bricks are those which are burned in a kiln and are commonly used in British construction. They are heated up to 1100°C to increase their strength and are comprised of [1]:

- 50-60% silica (sand)
- 20-30% alumina (clay)
- 2-5% lime
- 5-6% iron oxide
- <1% magnesia

Adobe bricks are commonly used throughout the world too and differ in their sand, clay, silt and sometimes straw content [2]. These are not fired like the bricks used in Britain and so do not require high temperatures.

It is also important to consider the biological and chemical processes in the human body, and how these interact with the materials necessary to construct bricks. These include the processes from

the initial ingestion of the material through to the excretion of the materials. For simplicity in considerations such as chemical reactions, purchasable forms of powdered silica and alumina have been assumed to be ingested.

Theory and discussion

The general process to create a brick begins with the mixing of the materials which have been size selected for the process. The addition of water at this stage helps create a homogenous clay mass. Next, this mass is compressed before being moulded into the desired shape. The brick is dried to remove the moisture it contains, and then fired if relevant for the type of brick produced [1].

It is not feasible to create a fired brick in the human body as its internal temperature of 37°C is too low. Therefore, the body would just be required to mix together the ingredients in the correct proportions to create a brick which could later be fired externally. The body would also not be able to create the desired shape of the brick. The adobe bricks do not require this heating, but do need the moisture removed from them.

The human body could, in theory, accept all the materials and water needed, mix the materials in the digestive system, and then remove the excess water to produce the pre-dried brick. The water can be removed internally by the small and large intestines,

which absorb most of the water received back into the body [3].

The main constituents of both types of brick are sand and clay, which are mainly comprised of silicon dioxide (SiO₂) and aluminium oxide (Al₂O₃) respectively. The first consideration for their ingestion is their toxicities. Silicon dioxide has a relatively high Lethal Dose 50 (LD50) which is the amount of a substance required to kill 50% of a test sample. It is also rated as a group 3 carcinogen meaning it cannot be classified as a compound which causes cancer in humans [4]. Silicon dioxide therefore carries no ingestion related health risks. Aluminium oxide however can irritate the gastrointestinal tract and damage the lung through inhalation [5] and so poses a health risk to the person trying to create these bricks.

The constituents of brick are easily ingestible and could be transferred into the stomach easily, where they can be mixed with water through peristalsis; the action whereby muscle contractions in the stomach help mix food. Assuming that hydrochloric acid is the only digestive chemical present in the stomach, once here the silicon dioxide will not react [6] but the aluminium oxide could, following this equation [7]:



This biological breakdown of one of the key components makes it highly unlikely either brick type could be created by the human body.

The next step to be considered is the processes occurring in the intestines. Water is removed here via a standing gradient flow, and compaction of the chyme also occurs to create the solid faecal matter. The aluminium chloride is absorbed by the body and converted into insoluble compounds which are excreted in faeces [7]. If any aluminium oxide reaches the intestines it will likely be poorly absorbed by the

body due to its insolubility and so could be present in faeces. Silicon dioxide however, can be absorbed by the body and is used as a dietary supplement [8] so will not be present in high levels in faeces.

Finally, the faecal matter would need to be moulded and dried. The intestines would remove most of the water but the rest of the drying would occur externally in a mould. The content of this would be vastly different to the materials initially ingested.

Conclusions

The phrase “s****ing a brick” is one used by many. Bricks are created through mixing, moulding, drying and sometimes firing. For a human body to produce a brick, which mainly consists of silicon dioxide and aluminium oxide, it would need to simulate these processes. The mixing could easily be achieved through peristalsis and the moulding is partially achieved through the compaction of waste material which would need further moulding. The human body would not be able to provide the temperatures needed for a fired brick to be created but this process can occur after defecation and moulding. The raw materials however will not reach the moulding stage. Aluminium oxide would react with the hydrochloric acid in the stomach to form aluminium chloride, whilst the silicon dioxide could largely be absorbed by the body. If this process was to be considered, it would not be advisable even if the brick could be formed due to the harmful properties of aluminium oxide. The conclusion of this paper is that it is not possible for the human body to actually defecate a brick.

Interestingly, whilst defecating bricks is not possible, Dr John Forth from The University of Leeds has patented a method for incorporating human faecal waste in the production of bricks to make them carbon negative [9] which may become common place in the future.

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