

TECHNICAL NOTE

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Coming to Terms with Facial Reproduction

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ABSTRACT: The process of building human faces by applying clay to skulls to generate leads for identification of unknown human remains is plagued by the use of a number of terms which are already used for other purposes. Reconstitution, reconstruction, restoration, death mask, moulage, and sculpture have all been used, but each is used in another context in forensic science. "Facial reproduction" is suggested as a term which is not already in use in forensic science, which is precise, and which would thus be preferred over any of the other terms.

KEYWORDS: physical anthropology, facial reproduction, human identification, musculo-skeletal system, facial reconstruction

In recent years, forensic anthropologists and others have been applying clay to human skulls in order to produce a likeness of an unknown deceased. Photographs of these faces can then be circulated in the hope that they will be recognized, providing an identification lead which can then be followed up in the usual way. First accomplished in Germany in the last century [1], three-dimensional plastic reproduction of faces on skulls has often been used by American anthropologists as a means of hinting at the appearance of individuals recovered as skeletons from ancient archaeological sites [2]. In the late 1960s, however, the focus shifted as interest in forensic anthropology grew. With the publication of the seminal paper by Snow, Gatliff, and McWilliams [3], it became apparent that there was real potential for this process in forensic science.

In the 1970s a number of anthropologists began to use facial reproductions as a means of producing investigative leads from which the identity of an unknown person could be established from medical or dental records. Fueled by papers, symposia, new data, and the refinement of methods, an increase in interest in the process has developed. It has gradually become more common and more generally accepted. Given novelistic and cinematic treatment in *Gorky Park* and the attention of the popular press, facial reproduction is now being received in some quarters with somewhat greater enthusiasm than is warranted by the state of the art. It is important to remember that a facial reproduction provides only leads and not an identification.

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Different Terms Describing Different Processes

Some confusion has resulted as practitioners have used different terms to refer to this process. With the volume of work and the number of practitioners increasing, it would appear that the time is at hand to adopt a term which would have universal and unambiguous application. Stadtmuller [4] used "plastic reconstruction" (*plastischen rekonstruktion*), a term also employed by others, including Suk [5] and Ilan [6]. His [7] used "sculpture" (*bilder*); Welcker [8] preferred "death mask" (*totdenmaske*); Suzuki [9] and Gerasimov [10] used "reconstitution," while Wilder [2]. Wilder and Wentworth [11], Krogman [12], and Snow et al. [3] seemed to oscillate between "reconstruction" and "restoration." The last two terms became widely used in the 1970s, with some preference being given in "restoration," for instance, by Snow [13] and Rhine [14]. Contemporary news articles also use such terms as "death mask," "moulage," and "forensic sculpture," in addition to "restoration" and "reconstruction."

In an attempt to settle upon a term which does not have other anthropological or forensic science applications and which conveys a precise and limited meaning, the author's laboratory has adopted the term "reproduction" [15]. This term avoids ambiguity and characterizes the process better. Other terms are inappropriate, misleading, and used to describe quite different processes, many of which are also currently in use in forensic science work.

Proper Application of the Terms

"Reconstruction" has generally been used in anthropology to refer to the process of reassembling a skull or other skeletal part from its shattered pieces [16,17]. In reconstruction one assembles separated components until the structure is once again complete. The implication is that only the recovered fragments are replaced in their original positions. Nothing is added, altered, or subtracted: hence, *reconstruction*. In applying clay to a skull one is not reconstructing what was there but adding something foreign to it. Reconstruction implies homogeneity of medium, which is not a condition achieved with facial reproduction.

"Restoration" is a term in long-established use by the dental profession to refer to the placement of a silver amalgam or some other substance in a tooth as a substitute for those portions lost to caries or accident [18]. The emphasis here is on *restoring* function. The term is also correctly applied in this sense when one speaks about the restoration of a piece of antique machinery, such as a car or a piece of furniture. In such instances, the intent is to make the item functional once more. The appearance is also returned to its original state, but this is secondary to the restoration of function. The application of clay to the outside of a skull does not in any sense restore it to its original function, but is aimed totally at reproducing its original appearance.

"Reconstitution" is used to describe the injection or immersion, or both, of a desiccated body or body part in a solution [19] with the intent of rehydrating it. The word "rehydration" is often used to refer to this process of returning fluid levels to approximately their living volume. However, Gillman [20] has even used "restoration" to refer to such rehydration, further burdening that already overworked word. To reconstitute is to replace the lost constituents in kind.

A "death mask" is the cast of the face of a dead person; a "moulage" is a mold of the imprint of an object, often for the purpose of identification, such as footprints, shoe prints, or tire tracks. These terms, too, are sanctified by prior usage and refer to processes used in forensic science which are totally different from three-dimensional plastic facial reproduction.

"Forensic sculpture" seems to connote something which is the exact opposite of facial reproduction. Sculpture is a process whereby an artist begins with a clear conception of

the end product, and a block of material from which everything that doesn't look like, for example, Thomas Jefferson is removed, or material is added to an armature to produce the desired end. The artist, in producing a likeness of Jefferson, would have worked either from the living subject or from photographs or other physiognomic information. The intention is to create something which is recognizably Jeffersonian. In facial reproduction, on the other hand, one starts with the skull and works outward. The only limitations are those imposed by the age, sex, race, and facial peculiarities of the individual deduced from an analysis of the skull.

As can be seen, each of these terms has prior application and is used in a specific way to refer to procedures quite different from that of building a clay face on a skull. All find some use within forensic science work but are used to describe other procedures. Moreover, the two terms most commonly used, "restoration" and "reconstruction," are already in use for quite different processes.

Facial Reproduction

The term "facial reproduction" is a convenient condensation of the more formidable (though very precise) "three-dimensional plastic facial reproduction." This would seem to be a reasonable term for describing the process and one that could supplant the older overlapping, confusing, and inaccurate array of terms currently being used. Reproduction is a term which is not otherwise in use forensically, anthropologically, or medically, except in a context in which confusion could not prevail. As it distinguishes the original face from the new one, the term is appropriate; it signifies that the medium is in some way different from the original and that the processes producing it are different. It conforms to the dictionary stipulation that it is in some sense a copy—an imitation. If facial morphology indeed reflects the shape of the skull beneath it, this imitation will faithfully reproduce the major features of the living person, and thus be recognizable.

The availability of recent data on facial tissue thickness [21,22] and new information on the reproduction of facial details [23,24] have stimulated new interest in the forensic science use of facial reproduction. With classes being taught and with the sessions on the topic organized every year at the American Academy of Forensic Sciences (AAFS) meetings by Betty Pat Gatliff, the process is receiving wider use when other investigative techniques have resulted in dead ends. With the broadening of applications it behooves us to consider carefully our obligation to communicate precisely among ourselves and with others before the entire process is fully computerized, rendering necessary further semantic tinkering. The Maxwell Museum has been using the term for some years now, and recommends the universal adoption of "facial reproduction" as the most appropriate designation of the process.

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