called the independent variable and the others are, or were, called functions or dependent variables. These functions may have derivatives and also physical dimensions. The independent variable has a derivative too; thus all the variables in this context are functions in this sense. The abstract functions of pure mathematics may have derivatives but do not have physical dimensions.

In some calculus books a variable is defined to be a symbol which stands for any element of a class; that is, "variable" means "common noun." This grammatical variable should not be confused with the variable quantity of applied mathematics.

2. A rational number is defined, e.g. by E. Landau, Foundations of Analysis, New York, 1960, to be an equivalence class of fractions, such as $\{\frac{2}{3}, \frac{4}{6}, \frac{10}{15}, \cdots\}$. A fraction is an ordered pair of integers. Distinct but equivalent fractions have different denominators. Thus the equivalence class of ordered pairs is a function.

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SOME MODERN MATHEMATICAL METHODS IN THE THEORY OF LION HUNTING[1]

OTTO MORPHY, D.Hp. (Dr. of Hypocrisy)

It is now 30 years since the appearance of H. Pétard's classic treatise [2] on the mathematical theory of big game hunting. These years have seen a remarkable development of practical mathematical techniques. It is, of course, generally known that it was Pétard's famous letter to the president in 1941 that led to the establishment of the Martini Project, the legendary crash program to develop new and more efficient methods for search and destroy operations against the axis lions. The Infernal Bureaucratic Federation (IBF) has recently declassified certain portions of the formerly top secret Martini Project work. Thus we are now able to reveal to the world, for the first time, these important new applications of modern mathematics to the theory and practice of lion hunting. As has become standard practice in the discipline [2] we shall restrict our attention to the case of lions residing in the Sahara Desert [3]. As noted by Pétard, most methods apply, more generally, to other big game. However, method (3) below appears to be restricted to the genus Felis. Clearly, more research on this important matter is called for.

1. (Surgical method) A lion may be regarded as an orientable three-manifold with a nonempty boundary. It is known [4] that by means of a sequence of surgical operations (known as "spherical modifications" in medical parlance) the lion can be rendered contractible. He may then be signed to a contract with Barnum and Bailey.

2. (Logical method) A lion is a continuum. According to Cohen's theorem [5] he is undecidable (especially when he must make choices). Let two men

approach him simultaneously. The lion, unable to decide upon which man to attack, is then easily captured.

3. (Functorial Method) A lion is not dangerous unless he is somewhat gory. Thus the lion is a category. If he is a small category then he is a kittygory [6] and certainly not to be feared. Thus we may assume, without loss of generality, that he is a proper class. But then he is not a member of the universe and is certainly not of any concern to us.

4. (Method of differential topology) The lion is a three-manifold embedded in euclidean 3-space. This implies that he is a handlebody [7]. However, a lion which can be handled is tame and will enter the cage upon request.

5. (Sheaf theoretic method) The lion is a cross-section [8] of the sheaf of germs of lions [9] on the Sahara Desert. Merely alter the topology of the Sahara, making it discrete. The stalks of the sheaf will then fall apart releasing the germs which attack the lion and kill it.

6. (Method of transformation groups) Regard the lion as a surface. Represent each point of the lion as a coset of the group of homeomorphisms of the lion modulo the isotropy group of the nose (considered as a point) [10]. This represents the lion as a homogeneous space. That is, this representation homogenizes the lion. A homogenized lion is in no shape to put up a fight [11].

7. (Postnikov method) A male lion is quite hairy [12] and may be regarded as being made up of fibers. Thus we may regard the lion as a fiber space. We may then construct a Postnikov decomposition [13] of the lion. This being done, the lion, being decomposed, is dead and in bad need of burial.

8. (Steenrod algebra method) Consider the mod p cohomology ring of the lion. We may regard this as a module over the mod p Steenrod algebra. Doing this requires the use of the table of Steenrod cohomology operations [14]. Every element must be killed by some of these operations. Thus the lion will die on the operating table.

9. (Homotopy method) The lion has the homotopy type of a one-dimensional complex and hence he is a $K(\pi, 1)$ space. If π is noncommutative then the lion is not a member of the international commutist conspiracy [15] and hence he must be friendly. If π is commutative then the lion has the homotopy type of the space of loops on a $K(\pi, 2)$ space [13]. We hire a stunt pilot to loop the loops, thereby hopelessly entangling the lion and rendering him helpless.

10. (Covering space method) Cover the lion by his simply connected covering space. In effect this decks the lion [16]. Grab him while he is down.

11. (Game theoretic method) A lion is big game. Thus, *a fortiori*, he is a game. Therefore there exists an optimal strategy [17]. Follow it.

12. (Group theoretic method) If there are an even number of lions in the

Sahara Desert we add a tame lion. Thus we may assume that the group of Sahara lions is of odd order. This renders the situation capable of solution according to the work of Thompson and Feit [18].

We conclude with one significant nonmathematical method:

13. (Biological method) Obtain a number of planarians and subject them to repeated recorded statements saying: "You are a planarian." The worms should shortly learn this fact since they must have some suspicions to this effect to start with. Now feed the worms to the lion in question. The knowledge of the planarians is then transferred to the lion [19]. The lion, now thinking that he is a planarian, will proceed to subdivide. This process, while natural for the planarian, is disastrous to the lion [20].

Ed. note: Prof. Morphy is the namesake of his renowned aunt, the author of the famous series of epigrams now popularly known as Auntie Otto Morphisms or euphemistically as epimorphisms.

Footprints

1. This report was supported by grant #007 from Project Leo of the War on Puberty.

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20. This method must be carried out with extreme caution for, if the lion is large enough to approach critical mass, this fissioning of the lion may produce a violent reaction.