

ENGLISH ABSTRACTS

THE IDENTITY OF *TEKHELET* (BIBLICAL BLUE DYE): NEW FINDINGS

Roy Emanuel Hoffman

The secret of the *tekhelet* (biblical blue) dye was lost long ago. Attempts to rediscover it have led to mistakes in the past, so that religious authorities are very wary of accepting its reintroduction. In this work, new findings are reported that resolve the remaining major objection, i.e. that the dying process had not been reliably reproduced without resorting to modern chemicals, unknown in ancient times. A description is given of the dying process using chemicals used in ancient times, and comparisons are made with similar dying techniques. The resulting color is analyzed, and compared with ancient writings and archaeological artifacts. We discuss the ramifications for religious law pertaining to the new findings reported here.

IDENTIFYING THE BIBLICAL *ARNEVETH* WITH THE MUSK-DEER AND THE *SHAFAN* WITH THE MOUSE-DEER: A HYPOTHESIS

Zvi Weinberger

The Torah identifies three animals that chew the cud but do not have split hooves: the camel, the *arneveth* and the *shafan* (Leviticus 11:4, 5, 6; Deuteronomy 12:7). Accepted translations of the Torah identify the *arneveth* with the hare and the *shafan* with the hyrax. However, neither hare nor hyrax chew cud in the ordinary sense. We propose that the biblical *arneveth* and *shafan* are not the animals known from contemporary parlance and common to modern Israel, but are rather animals not found in the Middle East.

We suggest that the *arneveth* corresponds to the musk-deer (Family *Moschidae*), native to Central Asia, and the *shafan* to the mouse-deer (Family *Tragulidae*), two genera of which are common to Southeast and South-Central Asia and a third to Central and West Africa. These animals are ruminants, and their feet have well-developed digits culminating in small individual hooves at the extreme of each digit, and not single split hooves on each foot.

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The shape of a musk-deer resembles a large hare, and so does its running pattern. For these reasons, we associate the *arneveth* with the musk-deer. The mouse-deer, genus *tragulus*, finds shelter in rock crevices during the day – as attributed to the *shafan* in Psalms 104:18. For this reason, we associate the *shafan* with the mouse-deer.

However, our proposal has its own difficulties. If the musk-deer and mouse-deer were common in ancient biblical Israel, and have since become extinct, why have their skeletal remains not been discovered? Both families have an uncommon distinctive feature, large upper canine teeth. Climatic considerations also cast doubt on the existence of these families in ancient Israel. If the *shafan* was not common in Israel, why would David and Solomon have referred to the *shafan* in their verses if the mouse-deer had not been familiar to their audience in Israel? In spite of these difficulties, we advance our proposal that conforms to a straightforward interpretation of the Torah's description.

SHAVING THE HEAD AS PART OF THE MOURNING RITES OF THE BETA YISRAEL

Yossi Ziv

In the Beta Yisrael community (the Ethiopian Jews), it was customary for the relatives of the departed to shave their heads during the days of mourning. This custom is contrary to the explicit prohibition, written in the Torah and accepted as Jewish Law (Halakhah) in the rabbinical literature, of not removing one's hair as part of the mourning process. Nonetheless, a thorough reading of the sources reveals that there is considerable literary and archeological evidence that cutting the hair, in the context of mourning, was practiced by Jews and gentiles alike. Moreover, in many books of the Bible, as a minority opinion in the literature of the *Tana'im*, and as written by the commentators on the Bible who wrote in the Middle Ages, one finds explicit references to the custom of head-shaving as something well-known, permitted, and accepted.

It may be assumed that the Jewish People observed two opposing customs. The precise plucking of every hair on the mourner's head was a permitted and acceptable custom. The tearing out of hair from the scalp to the point of bleeding, in a frenzy of sorrow, is the custom prohibited by the Torah. When a person is beside himself with grief, the precise, careful plucking of hair can get out of control and become

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an uncontrolled ripping of hair, scalp, and blood; the act proscribed by the Torah. For this reason, the rabbis put an end to this custom of plucking out the mourner's hair, and determined that the removal of the mourner's hair be prohibited in every way.

However, at the same time, Beta Yisrael had already been cut off from the main body of the Jewish people. They continued, therefore, to follow their ancient tradition: the careful removal of every hair on the mourner's head. In summary, we learn that acquainting ourselves with the customs of Beta Yisrael gives us new ways of understanding the development of Jewish Halakhah.

213-ROW TABLE – A NEW TOOL TO DETERMINE TYPE PERCENTAGES IN THE HEBREW CALENDAR

Eran Raviv

This paper is a continuation of an article that appeared in *B.D.D.* 22 entitled “Tablets and Tablet Shards – On *Molad* and their Characteristics.” In the previous paper, we presented a new understanding related to the possibility of the *molad* of Tishre occurring in each of the *hakalim* of the week, which differs from the previous assumption.

As an addendum to the paper, we are presenting a new 213-row table, which can be used to create a *siman* for each type of year similar to that in the “61-row table.” The new table adds an additional letter that indicates the type of *dechiya*.

The importance of this table is that it can be used as a precise and very accurate tool to calculate the prevalence and type of each *dechiya*.

We will analyze the table; explain the source of the number 213, and present additional implications of this new table.

CLASSIFICATION OF TEXTUAL WITNESSES OF THE
BABYLONIAN TALMUD – NEW STATISTICAL ASPECTS

Alex J. Tal

Research on the textual variants of a classical text aspires to find genealogical relationships between extant witnesses and represent them in a stemmatic tree. Because of the great complexity of its creation and transmission history, it seems that this is not a realistic aim with regard to Talmudic literature. A more realistic aim is the exposure of mutual relationships between the textual witnesses and the discovery of different families of textual traditions.

This study is based on the textual variants of tractate Beitzta from the Babylonian Talmud. Seven complete medieval manuscripts are extant for this tractate, and an equal number of partial ones that include more than ten percent of the complete text. Based on more than 850 variants, and aided by dedicated software, a distance matrix was constructed. A two-dimensional distance map was produced from this matrix by the MDS program PROXSCAL.

Analysis of this map led to the identification of a geographical axis, whose extremes represent the medieval Ashkenazi (German and French) and the Eastern textual traditions. Manuscripts with Spanish characterization are located between these two extremes. Parallel lines (simplex) were used to divide this map. In addition, it was found that a circumplex division is possible, and that the more complex – and therefore more original – manuscripts occupy the centers of the unconcentric circles. Thus, two facets were found – geographical and degree of complexity. Utilizing these new methods in the field of Talmudic philology is exceptionally challenging, in the way that it leads to new insights into the history of the textual traditions of the Babylonian Talmud.

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PREVENTING MODERN NUISANCES – CRITERIA AND STANDARDS

Shlomo E. Glicksberg

Detailed laws regarding nuisances and how they should be prevented are included in the Mishnah. Throughout the generations, our scholars and decisors often dealt with changes to those nuisances, and with nuisances that for various reasons did not appear in the original collection. This article will investigate the different methodologies used in the past for making halakhic decisions regarding nuisances as new situations arose. These methodologies may lead the way today when approaching modern ecological hazards such as pollution and global warming.

COMPUTATIONAL TOOLS FOR IDENTIFYING THE MOST
ACCURATE TENACHIC (OLD TESTAMENT) VERSION

Joseph Klein

Which versions of the Old Testament now in existence are most similar to the original? At what period did scholars arrange the internal division of the Pentateuch into five books, and the rest of the Old Testament into two sections? Without the original form, the textual differences between early versions have given rise to confusion. Today, attempts to find the correct form of the text are based on an examination of the early texts and the Massorah. The version based on the Aleppo Codex (*Keter Aram Zova*) and the Massorah is considered to be the most accurate. The present work discusses an independent computational method for determination of the period(s) in which the *Tenach* was divided into sections, books, and verses.



GERALD ARANOFF

**A Mathematical Proof:
Call the Sabbath Delight, the Lord's Holy Day Honored –
Reducing Expenditure on Weekdays to Allow
More for the Sabbath**

We prove mathematically – in a defined model with restrictive assumptions, using terms and concepts from economics – that consumers are better off when they have more food for the Sabbath at the expense of having less food for the other six days of the week! In this way we ... *call the Sabbath 'delight,' the Lord's holy day 'honored'...* (Isaiah 58:13), and we follow *Shulchan Aruch Orach Chaim* 242: "... decrease in the weekdays to honor the Sabbath...."

Like the manna that fell from Heaven for forty years in the desert – an *omer* per person, Sunday through Friday with double portions on Friday – we assume that consumers buy standardized food baskets, one basket per person per day, Sunday through Friday, of semi-perishable food such as meat, fish, bread, cheese, vegetables, fruit and drinks, and extra baskets on Friday for the Sabbath. We analyze benefits to consumers according to two alternative pricing schemes, whereby consumer expenditure and weekly food consumption are the same. We prove that consumers are better off according to the pricing scheme that allows for more food for the Sabbath day.

We believe that this proof has implications for business cycles, such as adequacy of cement capacity for the cyclical peaks – and also for seasonal cycles, such as sufficiency of hotel rooms for seasonal peaks. The lesson is that for all cyclical demand fluctuations the focus must be on sufficiency of supply for the peak of the demand cycle.

J. JEAN AJDLER

The Gregorian Revolution of the Jewish Calendar

The Jewish calendar is a luni-solar calendar. It works with lunar months, having lengths of 29 or 30 days, and with years of 12 or 13 months, in order to approach, as best as possible, the length of the tropical year.

The mean Jewish year is nevertheless longer than the tropical year by 6.658 minutes. This small difference creates a slow shift in the Jewish calendar and its festivals with regard to the solar year and its seasons. Based on a historical examination of the Jewish calendar, we establish that this shift has already reached about 5.4 days. This represents half of the shift reached by the Julian calendar at the time of the Gregorian revolution. The present shift of the Jewish calendar could thus become worrying. The aim of this paper is to present three acceptable solutions for the improvement of the Jewish calendar, to discuss them thoroughly, and to compare them.

In a mathematical supplement, after the examination and demonstration of the most advanced formulas of the Jewish calendar, we generalize them in order to develop a mathematical apparatus that will enable us to establish the correspondence of these improved Jewish calendars with the Gregorian calendar. This article should be regarded as a theoretical and mathematical analysis of what the Sanhedrin might consider doing when it is re-established.