

Beyânu's-Sinâ'a İsimli Yazma Eserde Bulunan Zanaat Konusundaki Bazı Açıklamalar

Some Remarks on The Crafts in The Manuscript '*Bayanu's-Sina'a*'*

Ahmet CAYCI**
İbrahim KUNT***

ABSTRACT

This research consists of manuscript which was written Abu'l-Fazl Hubeys b. Ibrahim et-Tiflisi in 629/1231. In principle, this writing has a general reference work. It is composed twenty chapters. Chemistry, physics, together with issues such as to contain, has been devoted to issues of art and craft. For example, ores painting, water to export precious stones, various weapons construction, the mixture of colors, such as preparation of the ink and the pen issues are discussed in the knowledge era. The piece of art and craft groups in need of raw material is obtained from the ways in which their experiences are put forward. Expression information is owned, directly beyond the creation of a work of art, in general, to obtain the raw material is defined. Therefore, scientific and artistic activities of the Anatolian Seljuks refinement emphasized that the culture and civilization through the work of some of the issues that will be exposed.

Keywords: Ibrahim et-Tiflisi, Bayanu's-Sina'a, Anatolian Seljuq, Manuscript, Crafts

Type of the Study: Research

ÖZET

Bu araştırma Ebu'l-Fazl Hubeys bin İbrahim et-Tiflisi'nin 629/1231 yılında kaleme aldığı yazma eserin incelenmesinden oluşmaktadır. Eser 884/1486 yılında istinsah edilmiştir. Süleymaniye Kütüphanesi, Ayasofya bölümü 3574 numarada kayıtlı olan eser, talik hat ile Farsça olarak yazılmış olup, 99 yapraktan meydana gelmiştir.

Bu yazmayı önemli kılan unsurların başında, ortaçağ İslam coğrafyasından günümüze intikal eden bilim ve sanat tarihi alanlarındaki eserlerin azlığı gelmektedir. Belki bilim tarihi sahası kısmen daha geniş olmasına karşın, bugün bile mevcut bulunan sanat eserlerinin 'nasıl' ve 'hangi bilgi birikimi temelinde' üretildiği soruları gizemini korumaktadır. Ele alınan yazma eser, bu gizeme cevap teşkil etmesi bakımından içerdiği fayda düşünüldüğünde, oldukça ön plana çıkmaktadır.

Ebu'l-Fazl Hubeys b. İbrahim et-Tiflisi sadece adı geçen kitabı kaleme almakla kalmamış, farklı alanlara hitap eden başka bir çok eser de yazmıştır. Bunlar psikoloji sahasından, Tıp ve astrolojiye kadar uzanan geniş bir sahayı kapsamıştır. Mevcut kitapların aynı tarihte yazılmış olması tesadüf olmamalıdır.

Ebu'l-Fazl Hubeys b. İbrahim et-Tiflisi, eserine Beyânu'n-Nücûm adlı eserini tasnifinden sonra çeşitli konulardan teşekkül eden bu kitabı yazdığını belirterek başlamaktadır. Kendisinden önce bu konularla ilgili eser yazarların bilgilerini toplayarak böyle bir eser oluşturduğunu ve eserini de Beyânu's-Sinâ'a olarak adlandırdığını belirtmektedir. Esas itibarıyla bu yazma eser ansiklopedik bir içeriğe sahiptir. Üzerinde çalıştığımız nüshada yirmi bölüm yer almaktadır. Kimya, fizik gibi konuları ihtiva etmekle birlikte büyük bir bölüm sanat ve zanaat konularına tahsis edilmiştir. Örneğin Cevherlerin Boyanması, Kıymetli Taşlara Su Vermek, Çeşitli Silahların Yapımı, Renklerin Karışımı, Mürekkep ve Kalemin Hazırlanması gibi meseleler döneminin bilgi birikimi içinde irdelenmeye çalışılmıştır.

Eserde sanat ve zanaat gruplarının ihtiyacı olan hammaddenin hangi yollardan elde edildiği konusundaki tecrübeler ortaya konulmaktadır. İfade olunan bilgiler, doğrudan bir sanat eserinin oluşturulmasının ötesinde, genel anlamda hammaddenin elde edilmesini tanımlamaktadır. Anadolu Selçuklularının ilmi ve sanatsal faaliyetlerinin inceliklerinin vurgulandığı bu çalışma sayesinde dönemin kültür ve medeniyetine dair bazı hususlar açığa çıkarılmış olacaktır.

Bu çalışmada, eserde bulunan bölümlerden sanat ve zanaat gruplarıyla ilgili bilgi içeren kısımlar ele alınmıştır. Bunlardan; "Kılıçlara ve Silah Aletlerine Su Vermek Hakkındaki" yedinci bölümden başlamak tercih edildi. Zira, her ne kadar kılıç ve silah görev olarak sanat ile tezat oluşturuyormuş gibi görülse bile, ortaçağdaki savaş ve savaş sonrası barış ortamının vazgeçilmez bir aracı durumundadır. Kılıca su verme işlemi birkaç alt başlık ile karşımıza çıkmaktadır. Bunların başında kesici aletlerin daha da keskinliğini sağlamak amacıyla neler yapılması gerektiği ile kılıç ve bıçakların renklendirilmesi konuları gelmektedir.

Kitabın giriş kısmında kozmik konularla ilgili bilgiler verildikten sonra aşağıdaki bölümler sıralanmaktadır:

1. Bölüm, Kimya Sanatı Hakkında. Bu bölümde kimya ilminin öneminden bahsedilerek genel kimya bilgileri aktarılmıştır.

2. Bölüm, Cevherler Hakkında. Bu bölümde kıymetli taşlar hakkında çeşitli bilgiler verilmiştir.

3. Bölüm, Cevahirin Boyanması Hakkında. Bu bölümde kıymetli taşların boyanması ve başka renklerle görünümünün sağlanması konusu aktarılmıştır.

4. Bölüm, Billur ve Minenin Boyanması Hakkında. Cam ve mine, önemli eşyalardan olması münasebetiyle, boyanması konusuna bir bölüm ayrılmıştır.

* This article was presented at XII. International Congress of Turkish Art, Jordan University, 5-9 October 2003, Amman 2003

** Doç. Dr., Selçuk Üniversitesi

*** Yrd. Doç. Dr., Selçuk Üniversitesi

5. Bölüm, Her çeşit Aynanın Boyanması Hakkında. Klasik dönemde ayna çok bulunan bir malzeme olmadığından, aynanın boyanması konusu bir bölüm olarak aktarılmıştır.

6. Bölüm, Kıymetli Taşlara Su Vermek Hakkında. Kıymetli taşlara su vermek, onların ömür ve dayanım sürelerini artırmak amacıyla uygulanan bir yöntemdir.

7. Bölüm, Kılıç ve Silah Aletlerine Su Vermek Hakkında. Kılıç gibi kesici ve delici aletlere su verilerek daha sağlam ve keskin olmalarının sağlanması konusu işlenmektedir.

8. Bölüm, Çeşitli Sanatlar Hakkında olup boyama işlemleriyle ilgili klasik usullerden kabul edilen Bağdat ve Horasan boyama yöntemlerinden bahsedilmektedir.

9. Bölüm, Renkleri Karıştırmak Hakkında. Bu bölümde renklerin elde edilişleriyle ilgili geniş bilgi verilerek renklendirme usulleri hakkında bilgi aktarılmaktadır. Ayrıca bu bölümde kına ile saç boyamadan da bahsedilmektedir.

10. Bölüm, Mürekkep ve Kalem Hazırlamak Hakkında. Hat sanatının önemli hammaddesi durumundaki mürekkebin elde edilmesi konusu bu bölümde aktarılmıştır. Bu kısımda dikkati çeken husus, birden fazla yöntemle mürekkep elde etme imkanına sahip olunduğudur. Mürekkeple ilgili durumlar ayrıntılı bir şekilde anlatıldıktan sonra kağıdın renklendirilmesi konusu aktarılmıştır.

11. Bölüm, Kağıttan Yazıyı Silmek ve Ortaya Çıkarmak Hakkında. Bu bölümde kağıt üzerinde görülen yazıyı görülmez hale getirmek ve görülmeyen yazıları ise görülür kılmak için hangi yöntemlerin tatbik edilmesi gerektiği aktarılmıştır.

12. Bölüm, Her Çeşit Hayvanat (Canlının) Özelliği Hakkında

13. Bölüm, Canlıların Defi (Yok edilmesi) Hakkında

14. Bölüm, Özel Cevherler, Meyveler ve Özel Bitkiler Hakkında

15. Bölüm, Her Çeşit Suların Kullanımı Hakkında

16. Bölüm, Ateşin Kullanımı ve Işık İlimleri Hakkında

17. Bölüm, İçecek ve İçecek İlimleri Hakkında

18. Bölüm, Her Çeşit İşler Hakkında

19. Bölüm, Şişelerden İzleri Silmek Hakkında

20. Bölüm, Cinsel Birleşme ve Gebeliğin Sırlarını Ortaya Çıkarma Hakkında

Bu bilgiler ışığında anlaşıldığı kadarıyla, bu eserle sanat ve zanaat gruplarının ihtiyacı olan hammaddenin hangi yollardan ve nasıl elde edildiği konusundaki tecrübeler ortaya konmaktadır. Burada ifade olunan bilgiler, doğrudan bir sanat eserinin oluşturulmasının ötesinde, genel anlamda hammaddenin elde edilmesini tanımlamaktadır. Örneğin eserde bulunan formüllerle elde edilen mürekkebin günümüze kadar gelen hat sanatının nadide eserlerinde de kullanılmış olması mümkündür. Bunun yanında dönemin çanak ve çömleğinin günümüzün müze vitrinlerini dolduran unsurlardan bir kısmı olduğu da aşikârdır.

Anahtar Kelimeler: İbrahim et-Tiflîsî, Beyânu's-Sinâ'a, Türkiye Selçukluları, Yazma Eser, Zanaat

Çalışmanın Türü: Araştırma

The manuscript we shall examine in this research was originally written by Ebu'l-Fazl Hubaysh b. İbrahim al-Tiflîsî¹ in 629/1231 and transcribed later in 884/1479-80.² The manuscript, consisting of 99 folios, is currently registered in Suleymaniye Library, Ayasofya (Hagiasophia) MS 3574.³ It was composed in Persian in the style of Ta'liq.

Before dealing with the manuscript itself, it would be better to point out two things. First of all, this manuscript was firstly published by İraj Afshar who studied many manuscripts on the history of medieval time.⁴ It was translated into Russian language by G. P. Mihalevic. This translation was based on the I. Afshar's edition.⁵ Concerning this book there are some discussions in journals and also very few detailed studies have been made by the scholars.⁶

Secondly, the main feature of this manuscript is that it contains valuable information on the history of science and especially on the history of art. As it is known, we do not have enough sources on the history of art as manuscript. In addition, compared with the other manuscripts of the same period, for example,

¹ According to documents Ebu'l-Fazl Hubaysh b. İbrahim al-Tiflîsî was born in the middle of the twelfth century and spent most of his life, under sovereignty of Anatolian Seljuk state, in the capital city of Konya and city of Kayseri. It is commonly accepted that he died at beginning of thirteenth century. For more information see Hubaysh b. İbrahim Tiflîsî, (1363), *Kāmilu'l-ta'bir*, ed. M.H. Ruknzade, Tehran, pp. 2-11

² It is not mentioned in the text the name of the transcriber.

³ There are other copies of the manuscript and one of them is kept in the Suleymaniye Library, Bağdatlı Vehbi, MS. No. 2253; second copy also is kept in the Suleymaniye Library, Yeni Cami, MS. No: 925.

⁴ Ebu'l-Fazl Hubaysh Tiflîsî, (1957), *Bayānu's-Sma'a*, ed. I. Afshar, Tehran.

⁵ Abu'l-Fazl Hubaysh Tiflîsî, (1976), *Opisanie Remesel Bayan as-Sana'at, Perevod S Persidskogo*, ed. G.P. Mihalovic, Seriya Pamyatniki Literaturi naradov Vostoka 51, Moskva.

⁶ Some Iranian scholars have made research on Tiflîsî's manuscript such as M. T. Bahar, (1321-1327), *Sebki Shinā'ī yā fārihi tataviri nesri Fariṣī*, Vol.1-3, Tehran; A. E. Dehkuda, (1938-1941) *Lugatnāme*, Tehran; Z. Safa, (1957), *Tāribi Edebiyāt der Iran*, Vol. 2, Tehran. We have also found some researchs made by Russian Iranologist, O. L.Vilchevskii, (1959), "Abu'l-Fazl Habeys İbrahim Tiflîsî Biyan as Sana'at, Opisanıye Tehnology", *CE*, No. 2, pp.180-182.

Bayanu's-Sma'a provides us with important data on how to make crafts. That's, it is very significant work which should be researched.

Ebu'l-Fazl Hubaysh b. Ibrahim al-Tiflisī studied various works and drew up more than twenty eight treatises like achievements of natural sciences, medicine, astrology, psychology, philology, occult sciences. Most of these works were completed at the reign of Anatolian Seljuk state that some of these books were written on honor of Sultan Kılıç Arslan II.¹ On the branch of psychology two manuscripts were written by the same author in Arabic.² *Takvimü'l-Edviye* is the only one example of the medical manuscripts that contained information mostly about the chemistry and the medical drugs prepared from the natural plants.³ Astrology was such a favored branch throughout the medieval history that al-Tiflisī also got impressed from this common trend and worked on this topic. So he composed his book entitled *Medhal fi İlmî'n-Nucum*.⁴ Except all these subjects we have seen that al-Tiflisī has written some books on the book of of Islamic topics and especially on the Quranic verses.⁵

At the very beginning, Ebu'l-Fazl Hubaysh b. Ibrahim al-Tiflisī states that he has commenced writing his work after the classification of *Bayan al-Nujum*. Having first collected the accounts written by his predecessors on the subject, he put them, together with his own insights, in the book form and entitled it "*Bayanu's-Sma'a*".

The manuscript we are working on now comprises twenty chapters. Beginning with some important information about the matters concerning cosmology in the Introduction, the work contains the following chapters in order:

1. Chapter (Bab), On the Art of Chemistry
2. " " On the Substances
3. " " On Dyeing the Substances
4. " " On Dyeing the Crystal and Enamel
5. " " On Dyeing the Mirror
6. " " On Watering for thinning the Precious Stones
7. " " On Watering for Thinning Swords and Weapons
8. " " On Various Art and Crafts
9. " " On Mixing Colors
10. " " On the Preparation of Ink and Pen
11. " " On Erasing the Script from the Paper and Bringing it out
12. " " On the Characteristics of Living Beings (Animals)
13. " " On the Extermination of the Living Beings (Animals)
14. " " On Special Substances, Fruits and Special Plants
15. " " On the Use of Waters
16. " " On the Use of Fire and Sciences of Light
17. " " On the Drinks and Sciences of Drinks
18. " " On Types of Works
19. " " On Cleaning the Stains of the Bottles
20. " " On Sexual Intercourse and Uncovering the Secrets of Pregnancy

In this short essay, we shall study the chapters dealing with arts and crafts. Of these chapters we would rather begin with the one entitled 'On Watering for Thinning Swords and Arm Weapons.' For swords and weapons, though far opposite to art in principle, became instrumental for the state of peace during and after wars in medieval times. The process of watering for thinning swords is treated in the work under a

¹ For instance the work of Tiflisī, *Kāmilu't-tabīr* and *Kānunu't-tib* were dedicated to the honor of Sultan Kılıç Arslan II (1155-1192). See Tiflisī, *Kāmilu't-tabīr*, p.3.

² Ebu'l-Fazl Hubaysh b. Ibrahim et-Tiflisī, *Kāmilu't-tabīr*, Suleymaniye Library, Ayasofya, MS. No. 0002008; Ebu'l-Fazl Hubaysh b. Ibrahim et-Tiflisī, *Melbamtu'l-Danyal*, Suleymaniye Library, Hekimoglu, MS. No. 000572

³ Ebu'l-Fazl Hubaysh b. Ibrahim et-Tiflisī, *Takvimü'l-Edviyye*, Suleymaniye Library, Ayasofya, MS. No. 0003600.

⁴ Ebu'l-Fazl Hubaysh b. Ibrahim et-Tiflisī, *Medhal fi İlmî'n-Nucum*, Nuruosmaniye Library, MS. No. 0002803.

⁵ For instance, we can mention here the manuscript of *Wucubu'l-Qur'an* and *al-Tellīs fi ilal al-Qu'ran*. See on these manuscripts Tiflisī, *Kāmilu't-tabīr*, pp.3,6.

few headings. Under the first heading, what one should do in order to sharpen the edge of the cutting tools is outlined. "For instance, in order to water the knife for sharpening one has to heat it first in the blazing fire and then water it with a piece of felt, which is dipped and soaked into the sulfate. When dyeing and coloring the swords and knives, it seems, many types of colors are used. To redden the sword, certain amount of iron sulfate is put in vitriol oil and mixed and stirred with water, and polished. Afterwards, the sword is enveloped in a leather skin and kept inside the skin for exactly one day. It is seen next day that the sword has turned completely red and become sharpened. If we want to make it yellow, again we take a certain amount of iron sulfate and mix it with water and then polish the sword with this processed liquid. We wrap it in a piece of felt and place it firmly under a heavy object. Right after one full day, we find it to have turned yellow. The sword can also be turned green if this process is applied: The water obtained from the squeezed leek is mixed with the silver water, added with some alum. The sword is polished with the water. Later it is rubbed and plated with iron sulfate and wrapped in a green fabric and grounded in the soil for a complete day. Consequently, it turns green." V.31b.

Chapter Eight bears the title 'On Various Arts.' Some methods and styles of dyeing and coloring are listed in this chapter. One of these methods, called 'Baghdadian Style of Leather Dyeing' is presented as follows: "The already tanned skin is first glued and some grated and ground tin is applied on it. The tin thereafter is smeared with the saffron water retained under the sun. This work is repeated roughly ten times per day until the skin has become colored." V34a.

In the same chapter, another style is titled 'Khorasanian Style of Leather Dyeing': "Some sarcocal (Anzarot) plant is crushed in the mortar. The ox bile (gall) and crushed sarcocal are melted together and then boiled in the water. In this case some saffron and Arabian glue are added to this mixture. All this mixture is repeatedly smeared onto the skin two or three times in a day. After the tanned skin is smeared with oil and saffron water, it is retained under the sun shine with the consequent of this work." V34a. So the skin has been got both solidity and become colored.

The Process of Doing Yellow Color: "The fig leaf and seed of safflower (Qurtum) are joined and mixed in a cup made of glass, on the surface of which is covered with clay. And then ten sitir¹ mastics are added to this mixture. After that some red gum juniper (Ar'ar) is boiled. Along with three dirhams saffron, three dirhams cinnabar are melted and joined with the main mixture. After the mixture has boiled, it is left for sometime to steep. The tanned skin is smeared with this paste; then it is dried under the sun. Consequently, it turns golden color." V34b. As it is seen from this process, it is the material of saffron that gives golden color. For the saffron has been used as the raw substance for obtaining yellow color and particularly golden color.

The Pen-work of Baghdadian Style: "The soil used for Earthen Pottery is melted in sheep bile (Gall). This mixture is inscribed with pen or applied by pen. Then it is left for dry. Yellow sulfur (Gügerd) is cast into fire together with pen. Until it turns black, it is kept in the smoke of that fire. Some animal feces are applied onto it; later it is scraped and cleaned out." V35b.

The Making Pottery and Other Things: "The iron scoria (Āhèniřim) is crushed like the powder and put in the mortar and then it is mixed with the egg white. It is pounded until gets to the density of ointment and added the soil that is pounded in different vessel." V35b.

The process of coloring skins has been detailed quite substantially in the manuscript. Coloring the skin in red: "Five sitir flesh slices (Qèlye) and five sitir madder (röwgenāş) are boiled in some water. It is kept in red as such until the leather had dried. Small amount of sugar mixed with saffron is applied onto the skin. This process is repeated several times until it becomes fried." V35b.

Coloring the Skin in White: "five sitir turmeric (Zèrd-cübe), one drachma sengi (Stone), half indigo (Nîl), two pieces gum tine (Aleke), a small part cuttlefish (Kefi derya) and some sands of sea are separately crushed and they all these things are mixed together." V35b.

Coloring the Skin in Black: "Twelve sitir seed of date (Ostehāni hormā), five pomegranate shell, five sitir myrobalan, one sitir splint of iron (Āhèni pāre) Arabian glue (Sèmgħi Arabî), one men² vinegar is

¹ A weight of 6.5 dirhams.

² A weight which varies according to the customs of the country, from 40 to 84 lbs but it is accepted that weight of 40 sir.

gathered up together and put under the sun shine or left in the tandır(oven). Finally, it gets ready to use for apply to surface.”V36b.

The Elimination of the Color of the Skin: “The skin is smeared with the sour apricot, which is soaked. It is kept as is for about twenty-four hours, then it is washed and cleansed with liquid obtained from radish (Têrf). This results in the fading of the colors.” V36b.

In the Ninth Chapter, we are given, under the title of ‘On the Mixing of the Colors,’ information about styles of coloring. Hints are also suggested on the application of colors. “If color is to be applied onto paper, it is mixed with Arabian glue or paste. If color is to be employed for the skin tanned in oil, then it must be mixed with yolk. By such process, colors can be more shiny, while lasting much longer. If an ornament is to be engraved on a glass, color must be mixed in bloody-water. In doing so, the shiny face of the glass can last longer.” V37a.

It has given more information about the obtaining the colors. For example, on the color of Verdigris: “The verdigris is first smashed to powder and then mixed with the Arabian glue. To this mixture a little saffron is added in order to make it more shiny and soft. If the green color is desired, more suffron continues to be added until that color has been obtained..”V37a.

Zincifre=Shengerf (Bright Red) Color: “Cinnabar is placed into mineral vinegar and ground into powder like kohl. Then it is washed in a vessel until it turns colored. The vessel is filled with water and boiled. It is waited until the water becomes limpid and settled down. The water later is poured. This work is repeated for a few times. The dust is removed. When it is dried, once again it is pound to powder, added with Arabian paste mixed with water. As a result, it becomes thickened. If it is used for coloring, it is further thickened; but if it is used for writing, a little paste (glue) is added to it to smoothen the point of the pen.” V37a-b.

Blue (Āsemān Gūn) Color : “When the indigo is pounded to powder it is melted with vinegar and pure Arabian glue water. So, the indigo must be washed as well as cinnabar.”V37b. Thus, it is produced the dark-blue color.

White-Lead (Sefidāb) Color: This is the process of the white color that comprises white-lead color. “It needs to mix up with pure water for cleaning and purify. If this paste is used for writing on the page, Arabian glue water is added to it. On the other hand, if it is used for painting or ornament, it needs to be melted with white egg”V38a.

As we have explained before, if you are going to attain blue or dark-blue color, firstly you need the indigo material. This subject has been described in the manuscript as follows: “ Blue Color; the dark-blue indigo and white-lead are ground together. If this color is expected to be suitable, white-lead is mixed with indigo as well.”V38a.

Red Color: This kind of color is very priority among the people for that reason it has been very favorite color. “Indian gum lac(lek) is joined with white lead (Sefidāb) and Arabian glue water or yolk , too.” V38a.

White-Rust Color: “Some white-lead is mixed with rust and this mixture melted into the Arabian glue water.”V38b.

Violet Color: “Dark-blue, mercuric sulfide, Indian gum lac and gum are gathered together and added some Arabian glue water and white of egg.”V38b.

Indigo (Nīlgūn) Color: “If the red arsenic is put in the same pot with indigo and added some Arabian glue or white of egg, at the result be obtained the position the opposition color against to raw material” V39a.

As we have seen in this research, the process for obtaining different colors from the main colors was widely used in this period. “This process is called ‘transition’ (Gozāre). By the help of transition system, it is possible to obtain more different color. For instance, transition of the color of indigo comes from orpiment (Zèrnīkh); transition of the blue from the dark-blue; the transition of the red from the white-lead.”V39a.

Another issue indirectly connected with the subject-matter of coloring is treated here. This is the subject of drawing picture, which makes up one of the branches of plastic arts. This matter is summarized as follows: “In order to draw a picture, one should know fist as to how draw, namely the technique of

drawing. At the outset, the exterior outlines of the object to be drawn must be determined. While drawing a picture, it is not possible to move from one color to another. Nor is it necessary to repeat mixing colors.”V39a.

In this chapter, we observe a shift from the subjects that have so far been discussed another subject. The subject matter of coloring hair with henna may seem closely related to the chapter of coloring, rather than that of health, because of the henna's conspicuous color. Concerning this topic, the following accounts have been provided:

“Henna gives hair vitality and brightness. There have been three techniques of coloring hair with henna. Some indigo leaves, and two times antimony (Ruyi sahte) of the first material, alum (Shab), parched arborvitae (Māzū) and iron scoria be mixed up and pounded. One night later, it is spread over the head. Another way applied for henna is as follows: Henna, indigo leaves and litharge (Murdaseng) is supplied little from each of them. Lime (Āhèk), parched arborvitae, antimony, alum, Endelus mud (Gelserrshost), gum tragacanth (Kètīrā) and clove blossom is supplied little from each of them and be pounded. Then it be spread over the head. In V39b, there is described another method of spreading henna: “One ratl¹ of unripe green arborvitae be supplied and blended with some olive oil. Then it is put into a ceramic pot. After having its cover been closed, the pot be put into warm oven. Upon letting the oven get cool, the pot be brought out and the ingredient poured into a bowl. Some of this arborvitae is supposed to be burned up and to turn to ashes. The remaining is mixed up with two dirhams of alum mine and one dirham of pounded clove blossom. Then all of them are sunk into the water of myrtle tree leaves (Murd). It is spread into the hair roots with beet leaves (Coghondèr). One night later, hair be washed first with hot and then cold water.”V40.

After elucidating the topic of coloring with henna, there arises a shift in the heading of chapter and so, it starts to speak of the craft of tanning. As a kind of leather, beaver leather has been preferred. “For a single beaver (Qunduz) leather, there is supplied 50 arborvitae. Each of the arborvitae be broken into two pieces and olive oil added, then lastly be put into a clean pot. The opening of the pot be spread over with dough and put into the warm oven. One can figure out whether arborvitae is well cooked or not through observing dough falling off from the outward face of the pot. After letting it have rest for a while, it is poured over a felt (Nèmèd) and another felt be spread over the first one. To make it single piece, a heavy staff be placed on it. Then it is well squeezed. Then two hundred dirhams of water be warmed and poured into a colored bowl. Arborvitae is added to the water and stirred up with a piece of felt. Then two dirhams of salt mine, five dirhams of ammoniac mine, three dirhams of antimony, three dirhams of Yemen alum and five dirhams of Arab glue be well squeezed and mixed up. Then this ingredient is spread over beaver leather, and the leather be left in a warm place. It is given three days to get dried. In order to make its poison fall off, it is pulped with hands and, to further make sure, it also is rubbed with bran. In order to clean it, it be rubbed with a piece of wet cloth.”V41a.

Chapter ten is dedicated to the production of ink,² which is an important raw material of calligraphy. The most striking point is that there is more than one way of producing ink. “In order to prepare ink and pen, some arborvitae is supplied, pounded and added three ratls of water. Then it is put into a clean bucket. It is kept on boiling down to the half. It is let to get cool. There is added red sulfate to this ingredient and so made black.” V41b.

To brighten it, there is added one dirham of Arab glue to every single ratl of water and stirred. To prepare another sort of ink, “some amount of arborvitae is supplied and eight times water of this amount be added to it. It be kept boiling down to the one-fourth. After taking it off from over the furnace, there be added some pounded red or yellow sulfate to it. It is left exposed to sunlight for a couple of days. If it is wished to have brightness, there is added some Arab glue to that ingredient.”V41b.

¹ One ratl is equal to 84 gr weight.

² We can find some descriptions about the ink making at the M. Levey, (1960), “The Manufacture of the Inks ‘liq’ Erasur Fluidsand Glues-a Preliminary Survey in Arabic Chemical Technology-”, *Chymia*, Vol. VI, pp.20-24. Also see U. Derman, (1967), “Eski Mürekkebciliğimiz”, *İslam Düşüncesi*, C.1, No. 1, İstanbul, pp.97-112.

As for the third type, if it is had in mind to prepare immediately usable ink, “five sirs¹ of arborvitae is supplied and well pounded. Then five dirhams of squeezed red sulfate is added. Then there be added one ratl of hot water and be kept boiling along with mixing up. Then it is put into a glass bowl and can be immediately used.” V41b.

There was gone about describing the way to produce the raw material, which is included in this group and called Starch (Nishaste) Ink. “Some amount of wheat be supplied and put into a copper pot and kept over a half-lower furnace till it gets parched and reddish. One should be careful in order to keep it unburned. It must be powdered like soil. Then there is added some arborvitae water and be left boiling. Then be added some sulfate. It can be put into a glass bowl and can be immediately used.” V42a.

For the Preparation of the Pen Ink: “One sitir Arabian glue, little water is mixed up together and it is boiled until half of the water left. And then one sitir burned arborvitae is added and boiled. Finally it is left to become cool and it is ready for use.”V42a.

For Another Type of Ink Making: “the powder of naphtha(Dūdeī Chèraghi Nèft) is crushed in the mortar until it is more powdering. Later it is added pure Arabian glue water. After that same plant is mixed up with sugar and it is brought together. Some salt, rose water, and saffron are added this mixture. It is kept in the glass-bottle and it is used for necessity” .V42b.

‘Indian Style Ink’ that is take other sort of ink varieties which is named according to regional producing factors.² The preparation of this ink as follows: “ When the pine nut wood pieces (Chūbī senowbèr) are fired it gives the soot to the air and you must put the one vessel on the fire to get gather the soot on the surface. And then take this soot thing and put it in the mortar and is crushed until it gets to the paste. Let to dry for a while and it is ready to added water.”V42b.

The reason of calling the ink ‘Golden-Colored Ink’³ might come from the fact that it has such a color tone. The way of preparing this sort of ink is described as follows: “There is supplied ten dirhams of lead mine and put into a bowl of wide neck. Then there is added less than one ratl of water. After adding some amount of tin(Erziz), the ingredient is kept boiling till the tin taints the water turn to its color. After being taken off from over the furnace, three dirhams saffron root and this ingredient is kept boiling till the color of saffron prevail the water. Then this water is distilled and poured into two dirhams of squeezed Arabian soap. After letting it get cool, it is kept boiling till it becomes thick and purified. So, it becomes ready to use.”V43a.

There is another way included in this classification which is presented as ‘Persian Type of Ink’. There were used the following materials in the preparing of the above ink. “Kedu(?) cool (Zughāli Kedu?) is mixed up with its black sticky mud, then is added the white of an egg. Then it is left in a shadow to get dried. There is added ten dirhams of Arabian glue to each one of the men and all of them are sunk into arborvitae water.” V43a.

After describing the preparing of ink, it shifts to another subject. This subject is examined under the title ‘Paper Coloring’⁴ What is the meant for paper coloring can be described as a type of sizing (Ākhar). Under this subheading, We see a stride of stages in the paper coloring. “If it is wished to color a paper without sizing, it is supplied some amount of ripe rise and be boiled in a clean pot of large neck. Then a piece of cloth is taken and rubbed with it. Then, this ingredient is spread over the paper. The paper is left in a piece of with glass even surface to get dried. Then, it is polished with the paper polisher. It is prefer to color with the using of starch sizing.” V44a.

In the Eleventh Chapter, the work that is done with paper continues to be examined. Information about ‘how to erase the writings from the paper and how to bring about every type of writing’ is provided in this chapter. If the writing is to be erased from the paper, the following procedure is executed: “White-Lead is crushed with Arabian glue. When it becomes dry and shiny smeared onto it. Later, a little alum and a little ripen radish are mingled and pound. It is left for drying. Then with this mixture is added over

¹ One sir is equal to 75 gr weight.

² For preparing the same ink, see M. Süleyman Sadedin Efendi, (1928), *Tuhfe-i Hattatın*, İstanbul, p.628; M. Yazır, (1972), *Medeniyet Aleminde Yazı ve İslam Medeniyetinde Kalem Güzeli*, II, ed. U. Derman, Ankara, p.185.

³ Nefeszade İbrahim, (1939), *Gülzarı Savab*, Kilisli Muallim Rifat, İstanbul, p.117.

⁴ For more information see U. Derman, (1968), “Kağıda Dair”, *İslam Düşüncesi*, C. 2, No., 5, İstanbul, pp.338-347.

it, that writing can be readable. If a candle wax is dropped slowly on the script, when this process is repeated a few times, the script fades away. If the script is wetted with the chewed gum, the heated ammonia is placed on it, then the script is cleansed."V44b.

In the second method, a result exactly opposite to that of the first method, 'Manifestation of All Types of Writing' has come out. "If we wish to inscribe a writing readable at night but unreadable daytime, we get a little bile of turtle and write with it. If writing is readable when it is wet but not readable when it is dry, the blood of pigeon is mixed with urine and heated in fire until it turn white. Thereafter, it is written with sal ammoniac (Nishādir) and left for drying." V44b.

As it has been noted above, one can find enough accounts about the experience of the artisans and the craftsmen in obtaining the necessary material for their works. Information provided here concerns as to how to obtain raw material for doing arts. For instance, the ink which was obtained by way of the above-mentioned process has been used in rare art samples which have come down until today. Besides, the pots and earthen wares of that period are the pieces of arts that fill the window-cases of today's museums. All these efforts, in general context, indicate the whole Islamic scientific level, but also it displays particularly level of science at the time of Anatolian Seljuk.

References

- Abu'l-Fazl Hubaysh Tiflīsī, (1976), *Opisanie Remesel Bayan as-Sana'at, Perevod S Persidskogo*, ed. G.P. Mihalovic, Moskva.
- A. E. Dehkuda, (1938-1941), *Lugatnāme*, Tehran.
- Ebu'l-Fazl Hubaysh Tiflīsī, (1957), *Bayānu's-Sma'a*, ed. I. Afhsar, Tehran.
- Ebu'l-Fazl Hubaysh b. Ibrahim et-Tiflīsī, *Kamilu't-tabīr*, Suleymaniye Library, Ayasofya, MS. No. 0002008;
- Ebu'l-Fazl Hubaysh b. Ibrahim et-Tiflīsī, *Melhamtu'l-Danyal*, Suleymaniye Library, Hekimoglu, MS. No. 000572
- Ebu'l-Fazl Hubaysh b. Ibrahim et-Tiflīsī, *Takvimu'l-Edviyye*, Suleymaniye Library, Ayasofya, MS. No. 0003600.
- Ebu'l-Fazl Hubaysh b. Ibrahim et-Tiflīsī, *Medhal fi ilmi'n-Nucum*, Nuruosmaniye Library, MS. No. 0002803
- Hubaysh b. Ibrahim Tiflīsī, (1363), *Kāmilu't-tabīr*, ed. M.H. Ruknzade, Tehran.
- M. T. Bahar, (1321-1327), *Sebki Shinā'ī yā fā'ihī tatavviri nesri Fari'sī*, Vol.1-3, Tehran
- M. Levey, (1960), "The Manufacture of the Inks "liqk" Erasure Fluidsand Glues-a Preliminary Survey in Arabic Chemical Technology-", *Chymia*, Vol. VI, pp.20-24.
- U. Derman, (1967), "Eski Mürekkebciliğimiz", *İslam Düşüncesi*, C.1, No. 1, İstanbul, pp.97-112.
- U. Derman, (1968), "Kağıda Dair", *İslam Düşüncesi*, C. 2, No., 5, İstanbul, pp.338-347.
- O. L.Vilchevskii, (1959), "Abu'l-Fazl Habeysh Ibrahim Tiflīsī Biyan as Sana'at, Opisanıye Tehnologiy", *CE*, No. 2, pp.180-182.
- Z. Safa, (1957), *Tārihi Edebiyāt der Iran*, Vol. 2, Tehran.
- M. Süleyman Sadedin Efendi, (1928), *Tuhfe-i Hatta'ın*, İstanbul.
- M. Yazır, (1972), *Medeniyet Aleminde Yazı ve İslam Medeniyetinde Kalem Güzeli*, II, ed. U. Derman, Ankara.
- Nefeszade İbrahim, (1939), *Gülzarı Savab*, Kilisli Muallim Rifat, İstanbul