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## CHIZMACHILIK VA CHIZMA GEOMETRIYA FANLARINI RIVOJLANISH TARIXI

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### ANNOTATSIYA

Maqolada chizmachilik va chizmageometriya fanlarining paydo bo'lish tarixi, hamda uning rivojlanishi haqida tarixiy manbalar ko'rsatib o'tilgan. Shu bilan birga O'rta osiyoda va O'zbekistonda chizmachilik va chizmageometriya fanini rivojlanishiga hissa qo'shgan olimlar to'g'risida ma'lumotlar keltirilgan.

**Kalit so'zlar:** plan, fazo, proyeksiya, vint, perspektiva, tasvir, aksonometriya, qiyshiq burchak, lekalo, geometrik.

## HISTORY OF DEVELOPMENT OF THE SCIENCES OF DRAWING AND DRAWING GEOMETRY

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### ABSTRACT

The article presents the history of the emergence of the sciences of drawing and descriptive geometry, as well as historical sources on its development. There is also information about scientists who contributed to the development of drawing and descriptive geometry in Central Asia and Uzbekistan.

**Keywords:** plan, space, projection, screw, perspective, image, axonometric, curve, pattern, geometrical.

### KIRISH

Bizga ma'lumki har bir fanning paydo bo'lish tarixi uni qanchalik muhim ahamiyatga ega ekanligidan, qadimiyligidan, jamiyatning taraqqiyotiga qo'shayotgan hissasidan dalolat beradi.

Chizmachilikning rivojlanishi rasm chizishdan boshlangan. Qadimda misrliklar turar joylarni, saroylarni, ibodatxonalami qurishda eng oddiy usul bilan boisada, bu inshootlarning shakl va o'lchamlarini tasvirlay olganlar.

Qadimgi zamon odamlari, qoyalarga o'yib ishlangan rasmlar, devorlardagi naqqoshlilik, xattotlik san'ati va shunga o'xshash tasvirlar o'sha davr xalqlarining chizma sohasidagi birinchi tushunchalarini aks ettiradi. Shaharlarning saqlanib qolgan planlari, binolarning plan va fasadlari hamda turli hujjatlar buning dalilidir.

### ADABIYOTLAR TAHLILI VA METODOLOGIYA

Chizmachilikka oid dastlabki ma'lumotlar eramizdan 300 yil muqaddam paydo boigan. Rim me'mori va muhandisi Mark Vitruviy (miloddan avvalgi 1-asrning ikkinchi yarmi) tekislikda binolarning tasvirlarini yasash yo'larini ishlab chiqqan. Bu bilan u to'g'ri burchakli proyeksiyalar yasash ishiga asos solgan.

O'zbekistonda Quyimozor va Oqtomda arxeologlar tomonidan qazish ishlari olib borilganda eramizdan oldingi 2-1- mingyilliklarga taalluqli odamning olddan va yonidan ko'rinish tasviri topilgan. VI-VII asrga oid kumush idishda binoning me'moriy fasadi tasvirlangan.

VII asrdan XV asrgacha o'rta Osiyoda fanning barcha sohalarida katta ilmiy yutuqlarga erishilgan. Masalan, mashhur olim **Muhammad ibn Muso al-Xorazmiy** (783—850) yunon olimi Ptolemey tomonidan bayon qilingan ba'zi masalalarni aniq emasligini chizmalar orqali isbotlab bergan. U o'z asarlarida turli mamlakatlar, dengiz va tog'lar, katta daryo va ko'llarning xaritalarini tasvirlagan. Olimning chizgan xaritalaridan o'ntasi bizgacha yetib kelgan. **Abu Nasr Forobiy** (873-950) o'zining geometrik yasashlarga doir asarida konstruktiv geometrik masalalarni yechishni bayon etgan. Ayniqsa, o'zgarmas pargar yordamida geometrik masalalar yechishni chizmalar orqali batafsil bayon etgan.

**Abu Rayhon Beruniy** (973-1048) shar ichida besh xil muntazam ko'pyoqliklar yasash mumkinligini chizmalar orqali isbotlab bergan. Bular noriy - to'rtyoqlik (tetraedr), orziy - oltiyoqlik (geksaedr), havoiiy - sakkizyoqlik (oktaedr), falakiiy - o'nikkiyoqlik (dodekaedr), moiiy - yigirmayoqlik (ikosaedr) lardir .

O'rta Osiyoda chizmachilikning muqarrarligini Abu Rayhon Beruniyning „Jismlar ko'lami fazoda uch tomonga: birinchisi uzunlik, ikkinchisi kenglik, uchinchisi chuqurlik yoki balandlik bo'ylab yo'nalgan bo'ladi. Jismning mavhum cho'zilishi (proyeksiyasi) emas, balki mavjud cho'zilishi (haqiqiy kattaligi) shu uch chiziq bilan aniqlanadi. Bu uch tomonning chiziqlari vositasida jism olti yoqqa ega bo'lib, shuncha yoqlari bilan u fazoda chegaralanadi. Bu olti voqlar markazida bir jonivor turgan bo'lib , uning yuzi shu yoqlardan biriga qaragan deb xayol qilinsa, u

yoqlar uning old, orqa, o'ng, chap va ost tomonlari bo'ladi, degan fikrlaridan bilib olish mumkin. Bu esa aynan zamonaviy proyeksiyalash usulining o'zginasidir.

**Abu Ali ibn Sino** (980-1037) o'zining „Aqllar me'yor“ asarida oz kuch sarf qilib, og'ir yuklarni yuqoriga ko'tarish, qattiq jismlarni bo'laklash, jismlami tekislash va boshqa maqsadlar uchun ishlatiladigan mexanik asboblarni besh xil ekanligini yozadi. Bular o'q, richag, chig'ir (blok), vint va pona hisoblanadi.

**Mirzo Ulug'bek** (1394-1449) yulduzlar xaritasini juda aniqlik bilan chizgan mashhur astronom olim ekanligi butun dunyoga ma'lum. Buyuk musavvir **Kamoliddin Behzod** (1455-1535) miniaturlaridan birida me'mor qoyida qurilish plani bilan tasvirlangan. Rassom o'z asarlarida qo'lgan „perspektiva“ qiyshiq burchakli aksonometriya hisoblanadi. O'rta Osiyo olimlari o'z asarlarini chizishda chizmalar chizish asboblari: jazvar (chizg'ich), juptak (reysfeder), mastura (lekalo), pargar yoki suvu (sirkul) dan foydalanganlar.

Chizmalarga handasa (geometriya), tarh (plan), tarz (fasad), reja jadvali (proyeksiya yoki chizma) degan nomlar berilgan. Demak, o'rta Osiyoda chizmachilik o'ziga xos rivojlangan. Qadimgi chizmalarning juda oz qismigina bizgacha saqlanib qolgan. Buning asosiy sababi qurilgan saroy, istehkom, masjid va madrasalar aynan qayta qurilmasligi uchun chizmalar yoqib tashlangan. Shunday bo'lsada, Iroqi muqarnas ko'rinishidagi kapitelli ustunning chizmasi (Usta Shirin Murod chizmasi) saqlanib qolgan. Bu chizmada ustun fasadda tasvirlangan bo'lib, uning shaklini ko'rsatish uchun chiqarilgan kesim ham qo'shib berilgan.

Fan va texnika rivojlanishi bilan chizmalar ham takomillashib bordi. Chizmalar o'z tarixiga ega bo'lishi bilan birga, xalqlar madaniyatining taraqqiy etishiga oid bo'lgan tarixni ham saqlab qoladi. Rasmlar, haykallar va chizmalarga qarab, qadimgi xalqlar to'g'risida ko'p ma'lumotlar olish, shuningdek, katta ahamiyatga ega bo'lgan yodgorliklarni qayta tiklash mumkin bo'ladi.

Fransuz olimi va davlat arbobi **Gospar Monj** (1746-1818) o'z davrigacha chizmachilikka oid bo'lgan barcha bilimlarni umumlashtirib, 1799-yilda „Chizma geometriya“ kitobini bosmadan chiqardi.

Shundan beri chizma geometriya **Monj metodi** deb ham yuritiladi. Monj kitobida chizmachilik grammatikasi chizma geometriya atroflicha bayon qilingan. Bu davrda chizma geometriyaning mohiyati juda katta bo'lib, Monjning o'zi „Chizma dunyodagi texnika bilan shug'ullanadigan barcha millatlar uchun tushunarli til, ya'ni texniklar tilidir“, degan edi.

Respublikamizda mavjud 26 fan nomzodlaridan 24 tasi shu ilmiy maktabda dissertatsiya himoya qilganlar va ulardan 4 tasi professor Sh.K.Murodov, R.Q.Ismatullayev, J.Ya.Yodgorov, D.F.Qo'chqorova va bittasi fan doktori bo'ldilar.

Moskva olimlaridan fan doktorlari, professorlar: I.I.Kotovning Toshkent aviatsiya zavodiga kelishi, N.N.Rijov va M.A.Tevlinlarning Samarqand arxitektura qurilish institutiga, S.A.Frolov va V.A.Yakuninlarning Toshkent politexnika institutiga kelib ilmiy seminarlar va olimpiadalar o'tkazishlari O'zbekiston va Rossiya olimlari orasidagi ilmiy aloqalar o'rnatilishi va bu professorlardan tegishli ilmiy va metodik maslahatlar olinishi chizma geometriyani Respublikada rivojlantirishga o'z ta'sirini ko'rsatgan.

### MUHOKAMA VA NATIJALAR

Demak, chizmalarni to'g'ri chizish usullari, shuningdek, chizmachilik xo'jaligining barcha sohasini to'g'ri tashkil qilish haqidagi fan *chizmachilik* deyiladi.

Xalq xo'jaligining turli tarmoqlarida foydalaniladigan chizmalar har xil nom bilan yuritiladi. Masalan, zavod, fabrikalarda turli dastgohlar, mashinalar, dvigatellar, o'lchash asboblari kabilarni yasash uchun tuzilgan chizmalar *mashinasozlik chizmalari*, bino, ko'prik, to'g'on, yo'l, kanal, mudofaa inshootlarini qurishda ishlatiladigan chizmalar *muhandislik-qurilish chizmalari*, yer sathini tasvirlash chizmalari *topografik chizmalar* deyiladi. Topografik chizmalardan xaritalar tuzishda, muhandislik inshootlarini, GES, suv ombori kabilarni loyihalashda va ularni tegishli maydonda to'g'ri joylashtirish maqsadida foydalaniladi. Sxemalar, grafiklar, plakat va diagrammalar *illustratsiya* chizmachiligi asosini tashkil qiladi.

### XULOSA

Yuqorida keltirilgan ma'lumotlardan kelib chiqib chizmachilikning barcha turlari asosi hisoblangan *geometrik chizmachilik* ham mavjud. Geometrik chizmachilik barcha yasash usullarini o'z ichiga olgan bo'lib, narsa va har xil egri chiziqlar majmuasining chizmasi bitta proyeksiyada bajariladi. Standartlashtirish texnika taraqqiyotini tezlashtirishda muhim ahamiyatga egadir. Standartlar texnik hujjatlar bo'lib, ular buyumlarning o'lcham, shakl, og'irlik, material va boshqa sifatlarini ko'rsatadi.

Chizma standartlari qonun kuchiga ega. Chizmalarni standartlashtirish bilan chizmalarni chizishda xilma-xillikka barham beriladi. Natijada chizmalarni taxt qilishda bir xillikka erishiladi, chizmalar qayerda, qachon va kim tomonidan chizilganidan qat'i nazar, to'g'ri tushunilishi ta'minlanadi.

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