

The Socio-Spatial Aesthetics of Space Formation

A New Perspective on the Concepts and Architecture of Walter Gropius and Aldo van Eyck

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space
formation

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the concepts and architecture of
Walter Gropius & Aldo van Eyck**



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of Walter Gropius and Aldo van Eyck

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A New Perspective on the Concepts and Architecture
of Walter Gropius and Aldo van Eyck

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SAMENVATTING

Inleiding en probleemstelling

Dit proefschrift gaat over 'ruimteforming', gedefinieerd als het deel van het architectonische en stedenbouwkundige ontwerp dat het creëren en structureren van materieel gedefinieerde binnen- en buitenruimtes betreft - zowel afzonderlijk van als in relatie tot elkaar en tot de open ruimte. Verder richt dit proefschrift zich, ten eerste, op de fundamentele betekenis van ruimteforming in relatie tot het architectonische ontwerpen en diens esthetiek. Ten tweede wordt nagegaan hoe Walter Gropius en Aldo van Eyck aan ruimteforming hebben gerefereerd als onderdeel van hun concepties over architectuur en architectuuresthetiek - in vergelijking met elkaar en met de benadering van ruimteforming aan het begin van de twintigste eeuw.

In het Engels is de term 'ruimteforming' een neologisme; het bestaat alleen als de letterlijke vertaling van de Duitse term 'Raumbildung'. In de Engelse taal wordt het fenomeen van het creëren van fysiek gedefinieerde ruimtes in plaats daarvan omschreven als de 'definitie' (Ching 1979) of de 'organisatie' (Unwin 1997) van ruimte. In de Duitse taal is het echter een bekend concept in het architectonische discours sinds het einde van de negentiende eeuw. In die zin werd architectonische ruimteforming in de afgelopen vijf decennia op verschillende manieren besproken. Ten eerste - en vooral buiten het Duitstalige gebied - wordt 'ruimteforming' in verschillende studieboeken uiteengezet, die zich op de basisprincipes van het architectonische ontwerp richten.¹ Ten tweede neemt de architectonische ruimte zelf (en op een conceptuele manier) in andere, voornamelijk Duitstalige studies, een

¹ Ching 1979, Von Meiss 1986, Unwin 1997, Janson 2006.

centrale plaats in.² Ondanks de verschillende perspectieven, benaderen beide soorten studies de architectonische ruimte in zijn fysieke conditie en als een synthese van massieve vormen en 'lege' ruimte. Daarnaast wordt de functionele (d.w.z. de gebruik gerelateerde en sociaal-ruimtelijke) betekenis van ruimtevorming op een nogal marginale manier behandeld. Tevens wordt een esthetische benadering van ruimtevorming - d.w.z. vanuit het perspectief van de zintuiglijke waarneming - grotendeels buiten beschouwing gelaten. Sinds de jaren tachtig hebben een aantal studies de architectonische ruimte vanuit een gebruik gerelateerd en sociaal-ruimtelijk, en gedeeltelijk cultureel, perspectief benaderd.³ In vergelijking met de bovengenoemde studieboeken en de expliciete theorieën over de architectonische ruimte, richten deze studies zich vooral op architectonische (en stedelijke) ruimte in termen van het individuele en collectieve gebruik en de toe-eigening van ruimtes. Dit impliceert gedeeltelijk de gebruik gerelateerde beweging in de ruimte, en deels ook het domein van de zintuiglijke waarneming (inclusief de waarneming van bijbehorende sociale en culturele betekenissen).

Met betrekking tot al deze (impliciete) referenties aan de architectonische ruimte en (aspecten van) ruimtevorming, is het eerste doel van dit proefschrift ruimtevorming zelf centraal te stellen en op die manier een concretere voorstelling van de artistieke en esthetische betekenis van ruimtevorming aan de bestaande kennis toe te voegen. Uitgaande van het gebruik gerelateerde en sociaal-ruimtelijke perspectief op de architectonische ruimte van de boven genoemde studies, begint dit onderzoek met de veronderstelling dat de fundamentele betekenis van ruimtevorming vooral in de gebruik gerelateerde en sociaal-ruimtelijke functie ligt, gedefinieerde ruimtes voor specifiek en verschillend gebruik en soorten toe-eigeningen te creëren. Bovendien wordt verondersteld dat de betekenis en de kwaliteit van ruimtevorming vooral besloten ligt in de manier waarop ruimtes door omsluiting, opening en rangschikking met elkaar en met de open ruimte verbonden worden. In die zin beschouw ik ruimtevorming als een essentieel middel in de ruimtelijke organisatie van het praktische en sociale leven. Daarnaast wordt verondersteld dat ruimtevorming ook hét deel van de architectonische vormgeving is dat architectuur als beeldende kunst kenmerkt en diens esthetische kwaliteit belichaamt - d.w.z. de specifieke wijze waarop architectuur esthetische ervaring genereert.

Mijn bijdrage aan een concreter begrip van ruimtevorming en zijn betekenis binnen het architectonisch ontwerp en de architectuursthetiek is op de theoretische

² Ungers 1963, Joedicke 1968, 1985, Van der Laan 1977, Meisenheimer 1978, 1984, Hajnóczy 1988, Schubert 2016).

³ Hillier en Hanson 1984, Feldtkeller 1989, Hertzberger 1996, Hillier 1996, Van Gameren 2006, Psarra 2009.

vraag gericht, hoe - op het niveau van ruimtevorming - de (gebruik gerelateerde en sociaal-ruimtelijke) functie van de architectuur en zijn esthetische ervaring aan elkaar gerelateerd zijn. Dit perspectief heeft in de uitwerking van een bepaalde theorie over ruimtevorming geresulteerd: de these van de sociaal-ruimtelijke esthetiek van ruimtevorming, die in het eerste hoofdstuk nader wordt uitgelegd.

Het tweede doel van dit proefschrift is de bovengenoemde ontwerptheoretische invalshoek op ruimtevorming met historisch onderzoek te combineren en in het bijzonder Walter Gropius' en Aldo van Eyck's concepten over architectuur en esthetiek te onderzoeken. Daarbij refereer ik aan Gropius als een protagonist van het zogenaamde 'Nieuwe Bouwen' en aan Van Eyck als een lid van de architectengroep Team 10. De reden om Gropius en Van Eyck te kiezen is dat allebei de architectonische ruimte vanuit een gebruik gerelateerd (Gropius) of een sociaal-ruimtelijk (Van Eyck) perspectief benaderden, die wederom een beslissende rol in hun algemene concepties over architectuur speelde. Daarnaast bevatten hun zienswijzen en posities een referentie aan architectonische ruimtevorming, hoewel deze referenties op verschillende manieren van impliciet karakter zijn. Maar het belangrijkste is dat de concepties van Gropius en Van Eyck een theoretisch concept over de waarneming van ruimte bevatten. Een concept waarbinnen het individuele, menselijke perspectief op ruimte een centrale plaats inneemt. Dit laatste aspect is van cruciaal belang, want in mijn these over de sociaal-ruimtelijke esthetiek van de ruimtevorming speelt de individuele zintuiglijke waarneming van ruimte een beslissende rol – vooral met betrekking tot de bovengenoemde relatie tussen de functionaliteit en de esthetiek van de architectuur.

Daarom worden Gropius' en Van Eyck's benaderingen van het architectonische ontwerp en de architectuuresthetiek onderzocht en de manier waarop zij naar ruimtevorming en waarneming van (architectonische) ruimte (impliciet) verwijzen. Verder onderzoek ik of (en zo ja, hoe) ruimtevorming en waarneming aan elkaar gerelateerd zijn, en of (en zo ja, hoe) ruimtevorming en de daarmee samenhangende functionaliteit aan architectuuresthetiek gerelateerd zijn.

De onderliggende ambitie om ontwerptheoretisch onderzoek met historisch onderzoek te combineren is, ten eerste, om mijn these van de sociaal-ruimtelijke esthetiek van ruimtevorming in een bredere theoretische en historische context te plaatsen. Ten tweede biedt deze combinatie de mogelijkheid om de zienswijzen van Gropius en Van Eyck op architectuur vanuit een nieuw perspectief en op een vergelijkende manier kritisch te onderzoeken. Daarnaast kunnen beide in relatie tot de discussies over de architectonische ruimte en ruimtevorming worden gepositioneerd, zoals deze aan het einde van de negentiende en het begin van de twintigste eeuw werden gevoerd. Daaruit kunnen conclusies worden getrokken over de manier

waarop de conceptie van de architectonische ruimte en ruimtevorming zich in de eerste helft van de twintigste eeuw heeft ontwikkeld.

Door deze benadering verschilt dit proefschrift fundamenteel van een historio-graphische benadering: Het is minder op een historische classificatie dan op een conceptuele evaluatie georiënteerd. Hoewel ik de opvattingen van Gropius en Van Eyck in een bepaalde historische ontwikkeling plaats (een ontwikkeling die in de context van een specifieke historische situatie en bijbehorende paradigma's moet worden begrepen), is de uiteenzetting met hun opvattingen primair conceptueel van aard. Met deze specifieke aanpak wil ik een bijdrage leveren aan een beter begrip van de ontwerptheorie en de ontwerppraktijk van Gropius en Van Eyck en aan het onderzoek van ruimtevorming binnen het 'kunstwissenschaftliche' (kunstwetenschappelijke) discours over de architectuur - in het bijzonder van August Schmarsow's esthetische theorie.

Structuur

Als een soort uitgebreide inleiding levert het eerste hoofdstuk de theoretische grondslagen van mijn analyse van Gropius' en Van Eyck's concepties. Deze grondslagen omvatten ten eerste de toelichting van mijn these van de sociaal-ruimtelijke esthetiek van ruimtevorming. Daarnaast wordt de algemene context van hun opvattingen uiteengezet vóór de specifieke details van Gropius' en Van Eyck's benaderingen worden uitgelegd. Daarna volgen de onderzoeksvragen, de uitleg van de methodologische benadering en een meer gedetailleerde uitleg van de structuur van de volgende hoofdstukken. Het hoofdstuk sluit af met een bespreking van de relevantie van mijn onderzoek in de context van bestaand onderzoek over Gropius, Van Eyck en het kunstwetenschappelijke discours over architectuur.

In het tweede hoofdstuk staat het begrip ruimtevorming centraal. Voorafgaand aan de bespreking van de posities van Gropius en Van Eyck, worden de verschillende (impliciete) referenties aan ruimtevorming binnen de Europese architectuurtheorie vanaf de Renaissance tot aan het begin van de twintigste eeuw samengevat. Vervolgens (met het doel zowel mijn these als de posities van Gropius en Van Eyck te contextualiseren) worden drie specifieke benaderingen aan ruimtevorming vanaf het begin van de twintigste eeuw in detail besproken: de theorieën van de kunsthistorici August Schmarsow en Paul Frankl en degene van de architect en architectuurtheoreticus Leo Adler. De selectie van deze auteurs is op hun aandacht voor ruimtevorming gebaseerd: zij refereren aan ruimtevorming zowel in haar functionele als esthetische betekenis en brengen beide aspecten gedeeltelijk met elkaar in verband.

De volgende hoofdstukken drie t/m zes gaan over Gropius en Van Eyck. In hoofdstuk drie en vier wordt hun conceptie van (de waarneming van) ruimte besproken en vervolgens hun (impliciete) referentie aan ruimtevorming.⁴ Hun concepties worden in relatie tot tijdgenoten en in relatie tot elkaar en tevens tot de theorie van August Schmarsow geanalyseerd. Gropius' en Van Eyck's (impliciete) wijze aan ruimtevorming te refereren worden op hun beurt in de context van hun algemene benadering van het architectonische ontwerp geplaatst en op basis van hun eigen architectuur nader geanalyseerd en geïllustreerd. In het zevende hoofdstuk worden de bevindingen van de voorgaande vier hoofdstukken samengebracht en hun concepten over architectuuresthetiek besproken, gevolgd door enkele laatste overwegingen.

Hoofdstuk 1: De these van de sociaal-ruimtelijke esthetiek van (architectonische) ruimtevorming, aanpak & onderzoeksvragen

In hoofdstuk 1 wordt ruimtevorming gedefinieerd als een samenspel van het omsluiten, openen en rangschikken van materieel gedefinieerde ruimtes: een wisselwerking die binnen een bepaalde ruimtevormende structuur een configuratie (en dynamiek) van 'binnenruimtelijkheid' enerzijds en 'buitenoriëntatie' anderzijds genereert. Verder wordt beargumenteerd⁵ dat voornamelijk de sociaal-ruimtelijke betekenis van ruimtevorming afstand en nabijheid te creëren - en de daarmee samenhangende betekenis van (sociale) toe-eigening van ruimtes - in deze ruimtevormende structuur 'geobjectiveerd' wordt. Door te verwijzen naar de waarnemings-georiënteerde esthetiektheorie van Gernot Böhme (1995, 2006), wordt verder gesteld dat die betekenis in deze 'geobjectiveerde' vorm waarneembaar is. Zij is waarneembaar als onderdeel van de zintuiglijke waarneming van een bestaande architectuur (ruimte-vormende structuur) als ruimtelijke omgeving en de gelijktijdige waarneming ervan als 'tegenovergesteld' object. Bovendien wordt gesteld dat ruimtevorming juist door deze sociaal-ruimtelijke betekenis en diens esthetische ervaring een integraal onderdeel van het sociale leven vormt. In die zin, zo mijn these, is op het niveau van

⁴ In plaats van in mijn onderzoek naar verschillende 'concepten' van ruimtevorming te verwijzen, wordt de term '(impliciete) referentie' gekozen. Dit wordt gedaan omdat Gropius noch Van Eyck de ruimtevorming expliciet als een zelfstandig onderwerp van architectonisch ontwerp behandelde en dus ook helemaal niet de term 'ruimtevorming' gebruikte. Beiden erkenden en behandelden - in verschillende opzichten - met de vanzelfsprekende realiteit van de architectonische ruimte en de bijbehorende ontwerp gerelateerde betekenis van ordening, omsluiting en de openingsruimten.

⁵ Met referentie aan de sociologische theorie van Georg Simmel over ruimte (Simmel 1903, 1908).

ruimtevorming de sociaal-ruimtelijke functie van de architectuur geïntegreerd in zijn esthetische ervaring, net zoals deze esthetische ervaring wederom is geïntegreerd in de sociaal-ruimtelijke functionaliteit van de architectuur, en daarom in het domein van het gebruik, het praktische leven en de sociale realiteit. Het is deze interrelatie die de esthetiek van ruimtevorming tot een sociaal-ruimtelijke esthetiek maakt.

Vanuit dat perspectief onderzoekt dit proefschrift Walter Gropius' en Aldo van Eyck's concepties over het architectonische ontwerp en de architectuuresthetiek met de volgende onderzoeksvragen:

Hoe benaderden Gropius en Van Eyck de menselijke waarneming van (architectonische) ruimte? (Hoofdstuk 3, 5)

Hoe refereerden zij naar ruimtevorming? Hoe gebruikten ze ruimtevorming als een ontwerpmiddel? (Hoofdstuk 4, 6)

Hebben zij de waarneming van (architectonische) ruimte met ruimtevorming (de aspecten naar welke ze verwezen) verbonden en zo ja, hoe hebben ze dat gedaan? (Hoofdstuk 7)

Hebben zij de functionaliteit van de architectuur en haar ontwerp met de architectuuresthetiek op een andere manier verbonden en zo ja, welk specifiek concept van esthetiek is eraan gerelateerd? (Hoofdstuk 7)

Door de beantwoording van de onderzoeksvragen wordt stapsgewijs de relatie tussen ruimtevorming, ruimte en de menselijke waarneming en Gropius' en Van Eyck's concepten van architectuuresthetiek onderzocht. Vóór de desbetreffende opvattingen van Gropius en Van Eyck in detail worden samengevat, wordt in de volgende alinea eerst de analyse van August Schmarsow's, Paul Frankl's en Leo Adler's referenties aan ruimtevorming samengevat.

Hoofdstuk 2: De benadering van August Schmarsow en twee andere benaderingen van architectonische ruimtevorming

Hoewel ruimtevorming een (impliciet) onderwerp ook binnen de architectuurtheorie van de Renaissance en de volgende eeuwen vormde,⁶ was het niet vóór het einde van de negentiende eeuw dat de architectonische ruimte zelf centraal werd gesteld. Dit gebeurde vooral in expliciet esthetische termen. Het was August Schmarsow (1893, 1896) die een eerste fundamentele esthetische theorie over de architectonische ruimte en de ruimtevorming ontwikkelde. Hij stelde dat het omsluiten van ruimte de (esthetische) essentie van het architectonisch ontwerp is. In navolging van Schmarsow's definitie van architectuur als 'Raumgestalterin' werd de architectonische ruimte (en diens vorming) twintig jaar later - zowel onder (Duitstalige) kunsthistorici als architecten - tot een essentiële en algemeen geaccepteerde categorie in de esthetische benadering van de architectuur.⁷ Kenmerkend voor Paul Frankl's en Leo Adler's benadering in die context is dat zij niet alleen de gebruik gerelateerde functie van de architectonische ruimtevorming aan de orde stelden - hetzij door te verwijzen naar het aspect van compositie of die van omsluiting - maar dat zij tegelijkertijd ruimtevorming met het domein van de esthetiek verbonden.

Op basis van een uitgebreide uitleg van Schmarsow's, Frankl's en Adler's algemene theorieën over architectuur en de inbegrepen referenties aan architectonische ruimtevorming, wordt het tweede hoofdstuk met de volgende overwegingen afgerond: Alle drie erkennen - in de context van drie verschillende theorieën over de architectuur - een gebruik gerelateerde functie van ruimtevorming. Adler wijst op de beschermende betekenis van omsluiting om bescherming te bieden tegen 'bedreigende gevaren'. Terwijl Schmarsow ook aan de sociaal-ruimtelijke betekenis van het omsluiten en openen van gedefinieerde ruimtes refereert. Frankl daartegen suggereert dat ruimtevorming vooral gaat om ruimte te bieden voor gebruik gerelateerde activiteiten.

Enerzijds is het alleen Frankl die de functie gerelateerde betekenis van ruimtevorming als een esthetische inhoud opvat, d.w.z. als een inhoud van waarneming en esthetische ervaring. Daarom bevat alleen Frankl's theorie een integratie van de functionaliteit en de esthetiek van de architectuur. Anderzijds verwaarloost Frankl in

⁶ Alberti [1443-52] 1965, Palladio [1570] 1984, Laugier 1753, Durand 1802-1805, Schinkel 2001, Hegel [1835-38] 1984, Bötticher 1842, Semper [1860-63] 1977.

⁷ Loos [1898] 1962, 1927, Riegl 1901, Berlage 1905, Schindler 1912, Strnad 1913, Frankl 1914, Schmarsow 1914, 1919, 1921, 1922, Gutkind 1915, Schumacher 1919, 1926, Karow 1921, Sörgel 1921, Brinkmann 1922, Zucker 1922, 1924, Frey 1924, Adler 1926, Klopfer 1926, Heufelder 1928.

zijn referentie aan ruimtevorming de binnen-buiten relatie en negeert daarmee de desbetreffende sociaal-ruimtelijke betekenis van ruimtevorming. In zijn opvatting over ruimtevorming als de 'vorming van een configuratie van gedefinieerde binnenruimtes' is het aspect van binnenruimtelijkheid en dat van buitenoriëntatie niet aanwezig. Daarnaast is Frankl's voorstelling van de waarneming van ruimte vrij algemeen en abstract.

Tenslotte is het Schmarsow die erin slaagt om met zijn theorie over de menselijke waarneming van ruimte de esthetische relatie tussen de mens en de gebouwde ruimte duidelijker te definiëren. Want in zijn benadering impliceert deze relatie een omvattende visueel-lichamelijke belevenis (ervaring) van (architectonische) ruimte. De essentiële waarde van Schmarsow's theorie is mijn inziens dat zij de waarneming van de architectonische ruimte als een dynamische waarneming van twee modi van een ruimtelijke omsluiting beter begrijpelijk maakt: de omsluiting van de gebouwde ruimte en van het waarnemende subject zelf.

Hoofdstuk 3: Walter Gropius' benadering van (de waarneming van) ruimte

Als protagonist van het 'Nieuwe Bouwen' vat Gropius' ruimte als een objectief gegeven werkelijkheid van onbeperkte ruimtelijke uitbreiding en potentiële beweging op, die hij echter vanuit de subjectieve waarneming benadert. Hij onderscheidt twee perspectieven: die van de ontwerpende architect en die van de mens in het algemeen. In het kader van het laatste perspectief ontwikkelt hij zijn concept van ruimte als 'getal' en 'beweging' waardoor de objectief gegeven toestand van zuivere driedimensionaliteit en beweging gerelativeerd wordt: namelijk tot een samenspel van (de waarneming van) afgebakende volumes van driedimensionale uitbreiding en onbeperkte beweging. Zijn streven naar bemiddeling tussen absolute ruimte en subjectieve ervaring onderscheidt hem bijvoorbeeld van Moholy-Nagy en Van Doesburg.

Tegelijkertijd ligt de bijzonderheid van Gropius' benadering in de ambitie ruimte eerder op een mentaal-psychologisch dan een zintuigelijke wijze 'tastbaar' te maken. Daardoor kenmerkt zich zijn benadering door het verwaarlozen van de lichamelijke, anatomisch-fysiologische constitutie van de mens in de ruimte en diens betekenis voor de waarneming ervan. Bovendien negeert Gropius het aspect van de lichamelijke beweging *in* de ruimte (en de tijd). Vervolgens ontbreekt in zijn concept van ruimte als 'getal' en 'beweging' een fundamenteel onderdeel van de menselijke waarneming en belevenis (ervaring) van (architectonische) ruimte. In plaats daarvan

wordt waarneming tot mentale waarneming gereduceerd, terwijl de zintuiglijke waarneming van ruimtelijke omsluiting, aldus binnenruimtelijkheid als het ware verdwijnt in de waarneming van ruimte als fysiek gedefinieerde volumes of onderdelen van ruimte. De zintuiglijke waarneming van openheid en buitenoriëntatie 'lost' op zijn beurt op in de w van ruimte als beweging. Als een bijkomend resultaat verschilt de benadering van Gropius - net als die van vele andere tijdgenoten - van Schmarsow 's aanpak, waarbij ook zijn voorstelling van de menselijke waarneming van ruimte als een alomvattende visueel-lichamelijke belevenis (ervaring) van (architectonische) ruimte buiten beschouwing wordt gelaten.

Hoofdstuk 4: Gropius' (impliciete) referentie aan architectonische ruimtevorming

Aan de ene kant is de (impliciete) wijze van Gropius aan ruimtevorming te refereren - vooral met betrekking tot het omsluiten en het openen van de ruimtes - consistent met zijn benadering van (de waarneming van) ruimte. Aan de andere kant is deze referentie sterk aan zijn algemene conceptie van de architectuur en haar ontwerp gerelateerd. Deze conceptie ontwikkelde hij aan het begin van de twintigste eeuw tot midden de jaren dertig. Ondanks hij na de Tweede Wereldoorlog deze benadering bekritiseerde, bleef zijn oriëntatie en de onderliggende motivatie ook in latere jaren overeind. Kenmerkend voor Gropius' conceptie zijn de volgende opvattingen: Ten eerste hield hij zich bezig met en propageerde het rationaliseren van de bouwproductie. Ten tweede streefde hij ernaar een industriële stijl in de architectuur te verwezenlijken. Ten derde probeerde hij artistieke vormgeving en industriële productie te synthetiseren. Tenslotte - net als andere vertegenwoordigers van het 'Nieuwe Bouwen' - was zijn ambitie het gebruik zelf als het ware vorm te geven, waarbij het concept van gebruik de maatschappelijke dimensie van gebruik omvat, inclusief de economische voorwaardelijkheid ervan.

Gropius' algemene conceptie van de architectuur en haar ontwerp impliceert een productie- en een gebruik gerelateerde referentie aan ruimtevorming. Voor zover deze is gebaseerd op deze conceptie, refereert Gropius aan ruimtevorming (in termen van omsluiting, opening en rangschikking van ruimtes) als een praktisch hulpmiddel in het vormgeven en de ruimtelijke organisatie van 'gebruik'. Deze (impliciete) referentie bevat tenminste een duidelijke superpositie zo niet een substantiële negatie van de onmiddellijke sociaal-ruimtelijke betekenis van het scheiden en omsluiten zoals het openen en verbinden van ruimtes. Bovendien, en in lijn met zijn benadering van de waarneming van ruimte, is een erkenbaar conceptie van de architectonische

ruimte als binnenruimtelijkheid geen onderdeel van Gropius' algemene conceptie van de architectuur en haar ontwerp.

Gebouwenanalyse

De analyse van het Bauhaus-gebouw in Dessau en de woongebouwen in Dessau Törten, Dammerstock, Siemensstadt en Buckow-Rudow bevestigen deze conclusie. In de ontwerpen van deze gebouwen is de primaire maar impliciete referentie aan ruimtevorming op de gebruik gerelateerde indeling van ruimtes gericht. Dit wordt aangevuld door een gebruik gerelateerde en vooral technische scheiding en verbinding van ruimtes. Ruimtes zijn *naast* elkaar gerangschikt; ze zijn niet als specifieke vormen van binnenruimtelijkheid ontworpen en als dergelijke ruimtes aan elkaar gerelateerd. In het geval van het Bauhaus-gebouw is dit soort ruimtevorming met een zekere desintegratie van het gebouw als een ruimtevormende eenheid gecombineerd en met een resulterend dualisme tussen het gebouw en zijn omgeving. Desintegratie en dualisme worden wel deels gerelativeerd: op ruimtevormend niveau door een centraal gelegen halfomsloten buitenruimte; het moment van desintegratie bovendien door middel van een homogeen gevelontwerp. Ook de analyses van de verschillende woningbouwontwerpen vertonen een duidelijke tendens naar een ruimtelijke scheiding tussen binnen en buiten, aangevuld met een 'niet-ontworpen' relatie tussen de woningen zelf. Vrijwel altijd baseert deze scheiding op een rangschikking van een reeks woningen die naast en boven elkaar worden geplaatst binnen een lineaire gebouwen structuur. Maar ook hier wordt de ruimtelijke scheiding gedeeltelijk gerelativeerd door de aanwezigheid van balkonruimtes en met behulp van het gevelontwerp. Op basis van de analyse van verschillende onderwijsgebouwen kan echter een algemene oriëntatie op het creëren van (half-) omsloten buitenruimtes en binnenplaatsen worden vastgesteld evenals op het ontwerpen van (een ruimtelijke dynamiek tussen) binnenruimtelijkheid en buitenoriëntatie. In de vorm van een halfgrond hoogbouw voor het Berlijnse woonwijk Buckow-Rudow vond deze oriëntatie uiteindelijk zijn weg ook in door hem ontworpen woningbouw. Toch illustreert in het bijzonder Gropius' ontwerp voor Buckow-Rudow het inconsistente karakter van zijn (impliciete) wijze aan ruimtevorming te refereren.

Hoofdstuk 5: Aldo Van Eyck's benadering van (de waarneming van) ruimte

Ook Van Eyck benadert (de waarneming van) ruimte vanuit het subjectieve perspectief van de individuele mens. Daarbij richt hij zich echter op de menselijke belevenis en ervaring *in* de ruimte dan de waarneming *van* ruimte. Gebaseerd op de filosofie van Henri Bergson - en in het bijzonder zijn notie van tijd als *durée* (duur) - verbindt Van Eyck belevenis en ervaring in de ruimte met het concept van de 'interiorisation' van ruimte (en tijd). Architectuur en haar ontwerp beschouwt hij als een middel om dergelijke 'interiorisation' mogelijk te maken. Door deze voorstelling te koppelen aan Martin Buber's notie van 'Zwischen', wordt de belevenis in ruimte (en tijd) aan tussenmenselijk contact en sociaal-ruimtelijke relatie gekoppeld, en op die manier in ontologische zin onderbouwd. Door op die manier ook het begrip van Buber te transformeren wordt diens 'Zwischen' tot een architectuur-ruimtelijk 'in-between'. Voor Van Eyck realiseert dit 'in-between' domein sociaal-ruimtelijke relaties op verschillende niveaus en maakt deze ervaarbaar.

Enerzijds lost vanuit dit perspectief de waarneming van ruimte zich op in het idee van een alomvattende 'interiorisation' van ruimte en tijd. Het is de identiteit gerelateerde belevenis en ervaring van ontmoeting en thuis te voelen die telt: *'de ontmoeting tussen de werelden - twee gebieden, de ontmoeting tussen mij en de buitenwereld, de ontmoeting tussen mij en de medemens'*.⁸ Anderzijds refereert Van Eyck aan de waarneming van ruimtelijke omslotenheid en openheid. Althans wijst hij op de sensaties van omsloten te zijn en oneindige extensie te beleven als de twee fundamentele soorten van de menselijke gewaarwording van ruimte. Maar deze referentie aan zintuiglijke waarneming van ruimte blijft een intrinsiek onderdeel van de 'interiorisation' van ruimte en versterkt de existentiële dimensie van deze notie.

Als we de benadering van Van Eyck met die van Schmarsow en Gropius vergelijken, zien we dat hij net als Gropius de visueel-lichamelijke waarneming van ruimte achterwege laat. De anatomisch-fysiologische benadering van Schmarsow, die de visueel-lichamelijke waarneming *van* de ruimte integreert, is opnieuw 'vervangen' door een louter psychologisch concept waarbij een innerlijk gevoel centraal wordt gesteld. Het verschil tussen beide 'psychologische' concepten is echter dat bij Gropius de zintuiglijke waarneming door mentale erkenning van ruimte vervangen wordt en bij Van Eyck door belevenis en (zelf)ervaring in de ruimte. Toch, en hoewel zijn referentie aan de sensatie van omslotenheid en openheid uiteindelijk aan de belevenis (ervaring) in de ruimte ondergeschikt wordt gemaakt, benadert Van Eyck

⁸ Forum 1960 3, 265.

de waarneming van ruimte in concrete zintuiglijke termen. Conform dit verschil tussen Gropius en Van Eyck, identificeert hij ook niet de gebouwde ruimte met (abstracte) volumes zoals Gropius dat doet. Veelmeer spelen de twee essentiële elementen van ruimtevorming – het omsluiten en het openen van ruimte – in zijn benadering van het architectonische ontwerp als het creëren van (een synthese tussen) binnenruimtelijkheid en buitenoriëntatie een centrale rol.

Hoofdstuk 6: Aldo van Eyck's (impliciete) referentie aan architectonische ruimtevorming

Ondanks de betekenis die Van Eyck aan het creëren van binnenruimtelijkheid in combinatie met buitenoriëntatie toewijst, zijn in zijn teksten nergens deze twee elementen van ruimtevorming noch het begrip ruimtevorming zelf uitdrukkelijk benoemt. Toch spelen de vorming van gedefinieerde ruimtes en ruimtelijke relaties een centrale rol in zijn benadering van het architectonisch ontwerp zodra het over het realiseren van de 'interiorisation' van ruimte door het creëren van 'in-between' domeinen gaat. Bovendien spelen het omsluiten en openen van ruimtes, het creëren van binnenruimtelijkheid en buitenoriëntatie een centrale rol in het architectuurruimtelijke creëren 'in-between' plaatsen.

Tegelijkertijd speelt in Van Eyck's algemene conceptie van de architectuur en haar ontwerp – en daarmee ook voor zijn (impliciete) referentie aan ruimtevorming – het principe van de 'relativiteit' een belangrijke rol. Hij identificeert de principiële relatieve aard van de hele materiële en immateriële wereld met de term 'tweeling-fenomenen'. Het begrip 'tweeling-fenomenen' houdt in dat de realiteit zich in verschillende opzichten als een wederkerige relatie tussen twee tegenovergestelde verschijnselen laat zien. Voor hem neemt het relativiteitsbeginsel, dus de 'tweeling-fenomenologische' aard van de werkelijkheid, een soortgelijke ontwerpbepalende positie in als het industriële tijdperk voor Gropius. Het vertegenwoordigt voor hem het algemene concept van de werkelijkheid. Een realiteit die ook in de architectuur moet worden omgezet. Daaruit volgt zijn waardering voor bepaalde ontwerprelevante 'tweeling-fenomenen', zoals 'binnen-buiten' en 'open-gesloten' (met een duidelijke sociaal-ruimtelijke betekenis) en 'deel-geheel', 'groot-klein' of 'diversiteit-eenheid' met een nogal formele betekenis. Het meest algemene tweeling-fenomeen is 'architectuur-stedenbouw'. Vanwege de fundamentele betekenis die hij aan een dergelijke 'tweeling-fenomenologische' manier van ontwerpen toekent, wordt het ontwerp van 'in-between' ruimtes met andere architectuur relevante tweeling-fenomenen gecompliceerd. Dit impliceert echter een mogelijke

superpositie van het maken van 'in-between' ruimtes door de toepassing van nogal formele ontwerpprincipes.

Gebouwenanalyse

De analyse van de verschillende gebouwen bevestigt dit argument. Ten eerste kan de complete ontwikkeling van Van Eyck's architectuur inderdaad worden beschreven als tussen het creëren van 'in-between' ruimtes en de formele implementatie van een 'tweeling-fenomenologische' ontwerpbenadering te oscilleren. In het Burgerweeshuisgebouw kan de aanwezigheid van beide en hun complementaire toepassing worden aangetoond. De Pastoor Van Ars-kerk en het Sonsbeek-paviljoen, die na de bouw van het Burgerweeshuis gerealiseerd werden, tonen op hun beurt een duidelijke focus op ruimtevorming en het creëren van 'in-between' ruimtes. De projecten ESTEC en Tripolis laten daarentegen een duidelijke superpositie van het realiseren van (een configuratie van) 'in-between' ruimtes door de formele implementatie van het tweelingsfenomeen 'deel-geheel' zien. De Algemene Rekenkamer toont tenslotte een integratie van het laatste in de bestaande manier van ruimtevorming.

Hoofdstuk 7: Conclusie

De afsluitende analyse van Gropius' en Van Eyck's concepties van de architectuur en haar esthetiek gaat over de vraag of ze wel of niet ruimtevorming en de waarneming van ruimte met elkaar hebben verbonden. Bovendien wordt nagegaan of ze wel of niet op een andere manier de functionaliteit en de esthetiek van de architectuur met elkaar in verband hebben gebracht en met welk specifiek concept van architectuuresthetiek zij dat hebben gedaan.

Met betrekking tot Gropius wordt geconcludeerd dat een dergelijke connectie niet aanwezig is. Ook op basis van zijn benadering (van de waarneming) van ruimte en de wijze hoe hij (impliciet) aan ruimtevorming refereert, is dit zelfs in potentiële zin niet mogelijk. De benadering en de soort van referentie vullen elkaar aan in hun abstractheid. Deze abstractheid illustreert wederom Gropius' fundamentele abstractie van het onmiddellijke sociale en het concrete ruimtelijke bestaan van de mens.

Het antwoord op de vraag of Van Eyck wel of niet de waarneming van ruimte aan ruimtevorming relateert, is gecompliceerder dan in het geval van Gropius. Ten eerste is het ingewikkelder omdat in zijn algemene conceptie van de architectuur de

onmiddellijke sociaal-ruimtelijke betekenis van ruimtevorming een belangrijke rol speelt. Ten tweede is deze link alleen op een indirecte manier aanwezig. Dit komt omdat, in de benadering van Van Eyck, de waarneming van ruimte in de vorm van twee ruimtelijke sensaties als het ware in een alomvattende 'interiorisation' van ruimte (en tijd) opgaat. De zintuiglijke waarneming van ruimte wordt daarbij naar sensuele (zelf)ervaring in de ruimte getransformeerd. Daardoor wordt het creëren van (een configuratie van) 'in-between' ruimtes - dus architectonische ruimtevorming - niet opgevat als een object van esthetische waarneming maar als een medium van deze (zelf)ervaring.

Daarom laten uiteindelijk beide concepties van de architectuur, haar ontwerp en esthetiek een daadwerkelijk concept van de zintuiglijke waarneming van (architectonische) ruimte achterwege. In overeenstemming ermee ontbreekt er op verschillende wijze een begrip van de betekenis van de zintuiglijke waarneming van de architectonische ruimte met betrekking tot de integratie van de sociaal-ruimtelijke betekenis van de ruimtevorming in de esthetische ervaring van de architectuur. In overeenstemming met dit gebrek, verbinden Gropius noch Van Eyck de waarneming van, of de belevenis en ervaring in de ruimte, met architectuuresthetiek. Echter verbinden allebei esthetiek in architectuur uitsluitend met de vormgeving van de architectonische vorm.

Afsluitende overwegingen

Van Eyck's benadering is uitermate interessant, omdat de sociaal-ruimtelijke betekenis van ruimtevorming centraal staat en omdat hij expliciet op de sensatie van ruimtelijke omslotenheid en openheid wijst. Door een traditioneel (objectgericht) concept van architectonische esthetiek blijft deze referentie aan het domein van de zintuiglijke waarneming echter gescheiden van het domein van de esthetiek en verdwijnt in plaats daarvan in belevenis en (zelf)ervaring *in* de ruimte. Uiteindelijk wordt de benadering van Van Eyck door een tegenovergestelde vorm van integratie gekenmerkt: De sociaal-ruimtelijke betekenis van ruimtevorming wordt niet door middel van de waarneming van de architectonische ruimte in de esthetische ervaring van architectuur geïntegreerd. In tegendeel: zowel de sociaal-ruimtelijke betekenis van ruimtevorming als de waarneming, of beter gezegd de sensatie van ruimte worden in belevenis en (zelf)ervaring *in* de ruimte geïntegreerd. Als gevolg ervan wordt in Van Eyck's benadering de sociaal-ruimtelijke betekenis van ruimtevorming niet opgevat als een esthetische inhoud die esthetisch werkzaam wordt maar als iets wat direct sociaal-ruimtelijk en sociaalpsychologisch werkzaam wordt.

Wat zijn benadering, ondanks deze contradictie, vanuit het perspectief van mijn these van de sociaal-ruimtelijke esthetiek van ruimtevorming zo interessant en waardevol maakt, is dat het volgende argument wordt bevestigd: zonder een louter object-georiënteerd concept van architectuuresthetiek te overwinnen is ook een daadwerkelijke integratie van de functionaliteit en de esthetiek van de architectuur niet te realiseren. Deze integratie is, of beter gezegd, zou een integratie zijn waarbij noch de esthetiek van de architectuur oplost in de functionaliteit van het architectonische ontwerp noch de functionaliteit in de achtergrond verdwijnt.

In deze context wil ik nog een keer op de theorie van August Schmarsow wijzen en de inbegrepen overwinning van een louter object georiënteerd concept van esthetiek; een benadering die mijn inziens bovendien tot een beter begrip bijdraagt van hoe we de sociaal-ruimtelijke betekenis van ruimtevorming waarnemen, en daardoor, van haar integratie in de esthetische ervaring van architectuur.

Tenslotte laat het bestaan van Schmarsow's theorie aan het begin van de twintigste eeuw een bijzondere tekortkoming zien in de ontwikkeling van de moderne architectuur in de eerste helft van de twintigste eeuw. Het is de tekortkoming van het Nieuwe Bouwen, inclusief Gropius, dat zijn leden er niet in slaagden de theoretische uiteenzetting met de architectonische ruimte en ruimtevorming door theoretici en architecten aan het begin van de twintigste eeuw daadwerkelijk verder te ontwikkelen. In het bijzonder werd Schmarsow's theorie van de architectuur als 'Raumgestalterin' (ruimteschepper) niet werkelijk aangenomen. In plaats daarvan bleef architectuuresthetiek slechts object georiënteerde en formele esthetiek. Tegelijkertijd, en zoals ook de analyse van de concepten van Paul Frankl en Leo Adler duidelijk maakt, had deze tekortkoming zijn oorsprong in het kunstwetenschappelijke discours zelf.

SUMMARY

Introduction and problem statement

This dissertation deals with ‘architectural space formation’, which is understood as the part of architectural and urban design that concerns the creation and structuring of physically defined spaces of inside and outside character separately as well as in relation to each other and to open space. Furthermore, it focuses on the fundamental significance of space formation in architectural design and aesthetics as well as the question of how Walter Gropius and Aldo van Eyck referred to space formation in their approaches towards architectural design and aesthetics separately, compared to each other, and in relation to the discussion of architectural space and space formation at the beginning of the twentieth century.

In English, the term ‘space formation’ is a neologism; it exists merely as the literal interpretation of the German term ‘Raumbildung’. In the English language, the phenomenon of the creation of physically defined spaces has been addressed as either the ‘defining’ (Ching 1979) or ‘organisation’ (Unwin 1997) of space; within the German language, this phenomenon has remained a familiar concept in architectural discourse since the end of the 19th century. However, and whether or not it is explicitly named as such, the phenomenon of space formation in architecture has been discussed in different ways over the last five decades. Firstly, and mainly apart from the German language, the phenomenon has appeared in several educational books that explain the basic artistic principles of architectural design.⁹ Secondly, in other primarily German-language studies, architectural space itself has taken centre stage in a

⁹ Ching 1979, Von Meiss 1986, Unwin 1997, Janson 2006.

conceptual way.¹⁰ Despite the diverging perspectives, both types of space formation examination primarily deal with architectural space at the level of its physical condition and as a synthesis of solid forms and ‘empty’ space. Next to this, the purposive (i.e., use-related and socio-spatial) meaning of space formation is addressed in a rather marginal way, while an aesthetic examination of space formation—that is, the handling of space formation in terms of sensuous perception—is more or less neglected. Since the 1980s, several other studies have quite successfully approached architectural space from a use-related, socio-spatial, and partially cultural perspective.¹¹ In comparison with the aforementioned educational books and the explicit theories on architectural space, these studies focus on architectural (and urban) space in terms of its individual and collective use and appropriation—including the moment of use-related orientation and movement in space—and also partially in connection with its perception, which includes that of associated social and cultural meanings.

In relation to all these (implicit) references to architectural space and (aspects of) its formation, this dissertation’s firstly focuses on space formation itself to thereby add to the existing knowledge a more concrete understanding of the artistic and aesthetic significance of space formation within architectural design and aesthetics. By adopting the previously mentioned studies’ use-related and social perspective on architectural space, my research takes as its starting point the assumption that the fundamental significance of space formation firstly lies in its purposive meaning to create defined spaces for particular and various uses and kinds of appropriation. Furthermore, the significance lies in the corresponding quality of space formation to separate and connect spaces with one another and with open space through their physical enclosing and opening as well as through their spatial arrangement or configuration. In this vein, I regard space formation as representing an essential means for the spatial organisation of practical and social life. Secondly, this research departs from the assumption that space formation also represents the constituent of architectural design that characterises architecture as a visual art and epitomises its aesthetic quality—that is, the quality of architecture to generate a particular aesthetic experience.

My contribution to a more concrete understanding of space formation’s significance within architectural design and aesthetics is now oriented towards the theoretical question of how—at the space formation level—the (use-related and socio-spatial) purposiveness of architectural design and its aesthetic experience are related.

¹⁰ Ungers 1963, Joedicke 1968, 1985, Van der Laan 1977, Meisenheimer 1978, 1984, Hajnóczy 1988, Schubert 2016.

¹¹ Hillier and Hanson 1984, Feldtkeller 1989, Hertzberger 1996, Hillier 1996, Van Gameren 2006, Psarra 2009.

This orientation has resulted in the elaboration of a particular theory on space formation: the thesis of the socio-spatial aesthetics of space formation, which I explain in Chapter 1.

This dissertation's second concern is to both combine this design-theoretical focus on space formation with historical research and investigate Walter Gropius's and Aldo van Eyck's approaches to architectural design and aesthetics from the perspective of this thesis. Here, I refer to Gropius as a protagonist of the so-called 'Neues Bauen,' and to Van Eyck as a protagonist of Team 10. The reason for particularly focusing on Gropius and Van Eyck is motivated by the fact that they likewise approached architectural space from use-related (Gropius) and socio-spatial (Van Eyck) perspectives, which played a decisive role in their overall approaches to architectural design. Next to this, both perspectives include a clear reference to space formation, although this reference is implicit in different ways. Most importantly, however—and different from the aforementioned studies as well as the approaches of all other protagonists of the Neues Bauen and Team 10—Gropius's and Van Eyck's approaches include a theoretical examination of the concept of space, within which the individual human perspective on space plays a pivotal role. This last difference is highly significant, since in my thesis of the socio-spatial aesthetics of space formation, the moment of the individual, sensuous perception of space plays a decisive role in the abovementioned relationship between the aesthetics and purposiveness of architectural design at the space formation level.

As a result, my investigation of Gropius's and Van Eyck's approaches to architectural design and aesthetics focuses on both their specific references to space formation¹² and their respective approaches to the perception of (architectural) space. Furthermore, I investigate whether and how they relate space formation and spatial perception to each other, and whether and how space formation and the associated purposiveness of architectural design are related to architectural aesthetics in a different way.

The underlying ambition in combining design-theoretical argumentation with historical research is to firstly position my thesis of the socio-spatial aesthetics of space formation in a broader theoretical and historical context. Secondly, this provides me

¹² Rather than referring in my investigation to different 'concepts' of space formation, the term '(implicit) reference' was chosen because neither Gropius nor Van Eyck explicitly dealt with space formation as an independent subject of architectural design; accordingly, they did not use the term 'space formation' at all. Both acknowledged and dealt—in different respects—with the self-evident reality of architectural space and the corresponding design-related significance of the arranging, enclosing, and opening of spaces.

with the opportunity to critically and comparatively investigate Gropius's and Van Eyck's approaches towards architecture from a new perspective. In addition, both can be positioned in relation to the examination of architectural space and space formation as it developed at the end of the nineteenth and the beginning of the twentieth centuries within the so-called 'kunstwissenschaftlichen' (art–scientific) architectural discourse. From this contextualisation, conclusions may in turn be drawn regarding how architectural space and space formation have been developed, approached, and understood during the first half of the twentieth century.

Structure

As an extensive introduction, Chapter 1 begins with the theoretical basis of my analysis of Gropius's and Van Eyck's approaches to architectural design and aesthetics. This basis firstly includes the thesis of the socio-spatial aesthetics of space formation and secondly includes this study's basic approach for investigating Gropius's and Van Eyck's approaches from the perspective of this thesis. The chapter concludes with the formulation of the resultant research questions, the applied methodological approach, and the study's relevance in relation to existing research on Walter Gropius, Aldo van Eyck, and the art–scientific discourse on architecture at the end of the nineteenth and the beginning of the twentieth centuries.

In Chapter 2, space formation again takes centre stage. Prior to the discussion of Gropius's and Van Eyck's positions, the various (implicit) references to space formation within European architectural theory are summarised from the Renaissance period up to the beginning of the twentieth century. Then, three particular approaches to space formation from the beginning of the twentieth century are discussed in detail: those of art historians August Schmarsow and Paul Frankl and that of architect and architectural theorist Leo Adler. This selection of authors is based on their attention to space formation both in purposive and aesthetic terms in addition to that which distinguishes them from other views on architectural space and space formation as it developed at the end of the nineteenth and the beginning of the twentieth centuries.

The following five chapters discuss Gropius and Van Eyck. Two subsequent chapters first investigate their respective approaches to the perception of (architectural) space and secondly discuss their (implicit) references to space formation. Here, Gropius's and Van Eyck's approaches to the perception of space are explained in the context of how they approach or conceive (architectural) space itself. These approaches are further explained in relation to contemporaries, in relation to each

other, as well as against the approach of August Schmarsow. In turn, their references to space formation are situated within the context of their general approaches to architectural design and are exemplified based on the analysis of the selected buildings.

In the seventh chapter, the findings of the previous four chapters are brought together, and the issue of whether and how the perception of space is related to space formation is discussed alongside the associated concepts of architectural aesthetics, which are eventually followed by some final considerations.

Chapter 1: The thesis of a socio-spatial aesthetics of (architectural) space formation, basic approach, research questions, methodological approach

Starting with the definition of space formation as an interplay of the enclosing, opening, and arranging of materially defined spaces, this interplay is firstly argued to generate, in the shape of a given space-forming structure, a configuration of ‘enclosed spatiality’ and ‘outside orientation’. Continuing with an investigation of the use-related and socio-spatial meanings of space formation (with reference to Georg Simmel’s sociological theory on space), it is further argued that the socio-spatial meaning(s) of space formation to create distance and proximity, as well as the associated meaning of a (social) appropriation of space, become objectified in this space forming structure, and are sensuously to be perceived. By referring in turn to Gernot Böhme’s perception-oriented concept of aesthetics, it is further argued that these meanings are to be perceived—and thus become aesthetically effective—as part of both the sensuous perception of a given architecture as a spatial environment (as a surrounding space) and its simultaneous perception as an ‘opposed’ object. Moreover, it is argued that by comprising use-related and socio-spatial meaning(s), space formation forms an integral part of practical social life, and that it forms such an integrated part by objectifying its socio-spatial meanings and by influencing the aesthetic experience of architecture in this vein. Here, the socio-spatial effect of a given space forming structure (of one of its elements) is intrinsically tied to such an influenced aesthetic experience. As a result, the use-related and socio-spatial architectural content is integrated into its aesthetic experience at the space formation level; this aesthetic experience is integrated, in turn, into the use-related and socio-spatial functionality of architecture, and, hence, into the realm of use, practical life, and social reality itself. This interrelation indeed qualifies, so the argument, the aesthetics of space formation as socio-spatial aesthetics.

From the perspective of this particular thesis on space formation - and based on the abovementioned more detailed explanation of motivation, this dissertation investigates Walter Gropius's and Aldo van Eyck's approaches to architectural design and aesthetics through the following research questions:

How did Gropius and Van Eyck refer to the human perception of (architectural) space?

(Chapters 3 and 5)

How did they refer to space formation? How did they use space formation as a means of design?

(Chapters 4 and 6)

Did they link the perception of (architectural) space with space formation (the aspects they referred to), and if so, how did they do so?

(Chapter 7)

Did they link the purposiveness and aesthetics of architectural design in different ways; and with what particular concept of architectural aesthetics did they do so?

(Chapter 7)

Analysing Gropius's and Van Eyck's approaches in this way implies the possibility of situating both in a broader context of architectural theory: the examination of space formation as an (essential) element of architectural design and aesthetics as it took place within that art-scientific discourse on architecture. Also, for this reason, my research was initiated by investigating the notion of space formation within this discourse. Next to situating Gropius and Van Eyck in this specific theoretical context, I analysed their approaches to (the perception of) space in the context of the Neues Bauen (Gropius) and Team 10 (Van Eyck). Next to their (implicit) references to space formation and their approaches to the perception of (architectural) space, the third research subject has been their concept of architectural aesthetics and the question of whether and how the three subjects were related. In this vein, my examination of Gropius's and Van Eyck's views on architectural design and aesthetics developed into a stepwise approach towards the present relationship between space formation, space and its human perception, and their concepts of architectural aesthetics.

Furthermore, this examination included the analysis of their work as practising architects—that is, their effective use of space formation as a means of design. The

selection of case studies was determined by my intention to more or less cover the comprehensive timespan of Gropius's and Van Eyck's lives as practising architects, to exemplify their theoretical positions, and to compare theory and practice. The kind of building analysis I applied was determined by the aim of analysing the particular type of space formation.

However, before I give a summary of my examination of Gropius's and Van Eyck's corresponding views in Chapter 2, the approaches or references to space formation of August Schmarsow, Paul Frankl, and Leo Adler are explained. Three references to space formation that in the course of my research turned out to be the most relevant concerning my aim of identifying considerations that confirm my approach to space formation are discussed.

Chapter 2: The approach of August Schmarsow and two other approaches to architectural space formation

Having also been a subject of architectural theory in the Renaissance period and the following centuries¹³—mainly in use-related terms—architectural space did not take centre stage in explicitly aesthetic terms prior to the last third of the nineteenth century. Moreover, at the very end of the nineteenth century, August Schmarsow (1893, 1896) indeed developed a first fundamental aesthetic theory on architectural space and its formation and 'proclaimed' the enclosing of space to be the very (aesthetic) essence of architectural design. Following Schmarsow's definition of architecture as 'Raumgestalterin' (the 'creatress' of space), architectural space and its formation developed into an essential and generally accepted category in the aesthetic examination of architecture among German-speaking art historians and architects.¹⁴ As a result, space formation was generally recognised—at least within the German-language area—as an essential feature of architectural design no later than the 1920s both in purposive and aesthetic terms. Within this context, Paul Frankl and Leo Adler directly referred to the purposive use-related function of architectural space formation—either the aspect of composition or that of enclosing—and simultaneously connected the use-related function with the aesthetics realm.

¹³ Alberti [1443–52] 1965, Palladio [1570] 1984, Laugier 1753, Durand 1802–05, Schinkel 2001, Hegel [1835–38] 1984, Bötticher 1842, Semper [1860–63] 1977.

¹⁴ Loos [1898] 1962, 1927, Riegl 1901, Berlage 1905, Schindler 1912, Strnad 1913, Frankl 1914, Schmarsow 1914, 1919, 1921, 1922, Gutkind 1915, Schumacher 1919, 1926, Karow 1921, Sörgel 1921, Brinkmann 1922, Zucker 1922, 1924, Frey 1924, Adler 1926, Klopfer 1926, Heufelder 1928.

On the basis of a comprehensive explanation of Schmarsow's, Frankl's, and Adler's overall theories on architecture and their included approaches to (the perception of) space and/or references to formation, this chapter concludes with the following considerations. Although all three of them refer to space formation in the context of three differing superordinate theories of architecture, they recognise a certain use-related meaning of architectural space formation. Here, Adler refers to the enclosure's protective meaning, wherein it provides protection from 'threatening dangers', whereas Schmarsow points to the socio-spatial significance of the enclosing and opening of defined spaces. Frankl, in turn, identifies the use-related meaning of space formation to provide space for use-related activity.

On one hand, and although Schmarsow acknowledges a certain socio-spatial meaning of space formation and Adler acknowledges an aesthetic notion of space, only Frankl conceives the purposive meaning of space formation as an aesthetic content—that is, a content of perception and aesthetic experience. As a result, only Frankl's approach implies an integration of the purposiveness and aesthetics of architecture. On the other hand, however, in his reference to space formation, Frankl neglects the inside-out relation and excludes the corresponding socio-spatial meaning of space formation. Accordingly, in his reference to space formation as the forming of a composition of defined inside spaces, the aspect of enclosed spatiality and that of outside orientation are absent.

Next to this, Frankl's reference to the realm of perception is rather general and abstract; if at all, he refers to the sensuous perception of architectural space in terms of visual perception. In this regard, Schmarsow succeeds at more clearly defining, through his theory on the human perception of space, the aesthetic relation between human beings and the built space because this relation herein implies a comprehensive, visual–corporeal examination of (architectural) space. The resulting essential value of Schmarsow's approach is that it allows for more clearly understanding the perception of architectural space as a dynamic experience of two modes of a spatial enclosure: the enclosing both of the built space and of the perceiving subject itself. Since this theory additionally transcends a mere object- or form-oriented aesthetics, it may also contribute to a more thorough understanding of how we perceive the socio-spatial meaning of space formation and, accordingly, its integration in the aesthetics realm—that is, in the aesthetic experience of architecture.

Chapter 3: Walter Gropius's approach to (the perception of) space

As a protagonist of the Neues Bauen, Gropius's approach to (the perception of) space is characterised by approaching space—which is conceived as an objectively given reality of unlimited spatial extension and potential motion—from the perspective of the individual human subject. We may herein distinguish between two perspectives: that of the designing architect and that of man in general. From this ambition follows Gropius's general concept of space as number and motion by which the objectively given condition of pure three-dimensionality and motion is modified. The condition is modified to an interplay between (the perception of) unlimited motion and limited, perceptible portions of space—that is, portions of three-dimensional extension. This striving for mediation distinguishes Gropius, for instance, from Moholy-Nagy and Van Doesburg, as he least aims to adapt the perception or the experience of space to new conceptions or realities of space.

At the same time, however, the specificity of Gropius's approach lies in his ambition to make space tangible in mental-psychological rather than sensuous terms. Owing to this orientation, this approach is also characterised by the neglect of the corporeal—the anatomical-physiological constitution of man in space and its significance to the human perception of space due to its characterisation by the resultant neglect of the experience of architectural space as a (relative) enclosure of the perceiving human being. Furthermore, with regard to the identification of space and motion as well as the human perception of the latter, Gropius neglects the aspect of corporeal movement *in* space (and time). As a result, his concept of space as number and motion misses a fundamental part of the human perception and examination of (architectural) space. Rather, this perception is reduced to a pure mental mode of perception, while the sensuous perception of spatial enclosure thus enclosed spatiality 'disappears' in the recognition of space as physically defined volumes or partitions of space. The sensuous perception of openness and outside orientation 'dissolves', in turn, into the recognition of space as motion. As a further result, Gropius's approach differs—as do those of many other contemporaries—from Schmarsow's aesthetic theory, herein also disregarding Schmarsow's clarification of the human perception of space as a comprehensive, visual-corporeal examination of (architectural) space.

Chapter 4: Gropius's (implicit) reference to architectural space formation

On one hand, Gropius's implicit reference to architectural space formation is consistent with his approach to (the perception of) space, particularly with regard to the enclosing and opening of space, while on the other hand, it is strongly related to his overall approach to architectural design. It is an approach that primarily developed from the beginning of the twentieth century until the mid-1930s and that Gropius himself critically reflected after World War II but whose fundamental orientation and underlying motivation remained valid in later years. This overall approach comprises various constituents: firstly, his preoccupation with rationalising building production; secondly, his strive for an industrial style in architecture; and thirdly, the resultant demand of synthesising design and industrial production as well as his specific interpretation of typification in architecture. Finally, as is the general case with the Neues Bauen, the approach includes the ambition to design the use itself, whereby the concept of use includes the societal dimension of use (including its economic conditionality).

Gropius's overall approach to architectural design implies a production and a use-related reference to space formation. This reference is not explicitly stated, although it implicitly results from this approach. As far as it was based on this overall approach to architectural design, Gropius's implicit reference to space formation therefore refers to space formation—it may be in terms of the enclosing, the opening, or the arrangement of spaces—as a practical tool in the designing and therefore in the spatial organisation of use. Accordingly, Gropius's reference to space formation at least implies a clear superimposition, if not a substantial neglect, of the immediate socio-spatial meaning of separating and enclosing spaces as well as opening and relating rooms because it correspondingly and practically emphasises the spatial arrangement of spaces. The socio-spatial meaning (or content) of space formation, which is to create protection and privacy by means of shaping enclosed spaces, does not seem to have played a particular role in Gropius's view. In line with his approach to (the perception of) space, a clear notion of architectural space as enclosed spatiality cannot be detected in Gropius's approach to architectural design.

Building analysis

The analysis of the Bauhaus building and various residential building designs (Dessau Törten, Dammerstock, Siemensstadt, Buckow Rudow) confirms this conclusion: for

these buildings, the primary although implicit reference to space formation concerns the use-oriented arrangement of partitions (or volumes) of space, which is complemented by a corresponding practical and rather technical separation and connection of spaces. Spaces are arranged next to one another rather than designed as enclosed spatiality, and they are neither related nor opened to one another as such types of spaces. In the Bauhaus building case, this kind of space formation is combined with a disintegration of the building as a space-forming entity and with the resultant dualism between the building and its surroundings, although both are at least partially counteracted at a space-forming level by the design of a central courtyard-like space. The moment of disintegration is additionally balanced at a form-related level by means of a homogeneous façade design. The analysis of the residential building designs imply a clear architectural tendency to a spatial separation of the inside from the outside areas. This separation is unified with a non-designed relation between the dwellings themselves and is almost always a separation between a series of dwellings, arranged next to and above one another within a linear building structure. This separation is balanced by the presence of balcony spaces and is again counteracted by the (formal) design of the façade. However, on the basis of several educational buildings, I could demonstrate the general architectural orientation towards the designing of enclosed outside spaces and courtyards as well as the designing of a spatial dynamic between an enclosed spatiality and outside orientation. In the shape of a semi-circular high-rise building, this orientation eventually found its way into residential architecture. Nevertheless, Gropius's design for Buckow-Rudow particularly illustrates the inconsistent nature of his (implicit) reference to space formation.

Chapter 5: Aldo van Eyck's approach to (the perception of) space

Van Eyck's approach to (the perception of) space is also characterised by approaching space from the perspective of the individual human being, although the human experience *in* space rather than the perception *of* space takes centre stage here. Based on Henri Bergson's philosophy, particularly his view of time as '*durée*' (duration), this experience-oriented approach to space firstly refers to space in terms of its 'interiorization' in unity with that of time. Architecture, including spatial design, is regarded as a means of framing and enabling such interiorization. Linking this concept to Martin Buber's notion of '*Zwischen*', the experience in space and time becomes linked to the realm of inter-human and socio-spatial relations and is thus substantiated in an

ontological sense. By simultaneously extending Buber's notion to space, and particularly to architectural design, his 'Zwischen' becomes an architectural-spatial 'in-between' realm. Van Eyck consequently defines this 'in-between' as establishing socio-spatial relations at various levels and subsequently enabling and framing their experience.

Within this conception, the perception *of* space dissolves into the notion of an all-encompassing 'interiorization' of space and time, as the identity-related experiences of belonging and encounter are what counts: '*the encounter between the worlds—two areas, the encounter between me and the outside world, the encounter between me and the fellow human being*'.¹⁵ At the same time, Van Eyck also points to the perception of enclosure and openness—at least in terms of the *sensation* of being enclosed, infinitive extension, and the two fundamental types of man's spatial sensations. However, this rather implicit reference to the sensuous perception of (architectural) space remains an intrinsic part of the 'interiorization' of space and substantiates its existential dimension. Comparing Van Eyck's approach with those of Schmarsow and Gropius, we can conclude that he shares with Gropius the same lack of any reference to the realm of body-related perception or experience *of* space. Schmarsow's anatomical-physiological approach, which integrates sensory perception and the corporeal examination of space, is again 'replaced' by a purely psychological concept that takes an inner feeling—or experience—as the very point of departure. However, the difference between both psychological concepts is that sensuous perception turns into mental recognition in Gropius's case and (self-)experience in Van Eyck's case. In addition, Van Eyck refers to the perception of space in concretely sensuous terms, although his reference to the sensation of enclosure and openness remains integrated into and thus subordinated under the experience *in* space. In line with this difference between Van Eyck and Gropius, the . and opening—play a central role in his approach to architectural design, as does the creation of (a synthesis of) enclosed spatiality and outside orientation.

Chapter 6: Aldo van Eyck's (implicit) reference to architectural space formation

Despite the importance the enclosing and opening of space represented for Van Eyck, he also referred to space formation in an exclusively implicit way, meaning he neither mentioned nor discussed space formation itself. At the same time, and as far

¹⁵ Forum 1960 3, 265.

as the architectural implementation of the ‘interiorization’ of space by the creation of ‘in-between’ realms is concerned, the forming of defined spaces and spatial relations plays a central role in Van Eyck’s approach to architectural design. Moreover, he regards the enclosing and opening of space and the resultant shaping of enclosed spatiality and outside orientation as the two essential instruments in creating ‘in-between’ spaces, thereby enabling a specific experience and thus the interiorization of space. As a further result, Van Eyck’s implicit reference to space formation clearly differs from that of Gropius in that it does not neglect the socio-spatial meaning of space formation but rather takes centre stage.

At the same time, however, Van Eyck’s overall approach to architectural design and, accordingly, his reference to space formation are connected with a keen focus on the principle of ‘relativity’. He identifies the principle relative nature of the material and immaterial world with the term ‘twin phenomena’, which basically implies that reality establishes itself in various respects as a reciprocal relation between two opposed phenomena, or rather between two phenomena that we render as opposing each other. For Van Eyck, the principle of relativity—the ‘twin-phenomenological’ nature of reality—takes a similar design-determining position as did the Industrial Age for Gropius in that it represents the overall concept of reality that must be also established at the level of architectural design. From this follows his orientation towards the implementation of particular design-relevant ‘twin phenomena’. Here, Van Eyck’s design-relevant twins are ‘inside–outside’ and ‘open–closed’, with a clear (socio-) spatial significance, and ‘part–whole’, ‘large–small’, or ‘diversity–unity’, with a rather formal significance. The most general twin phenomena are those of ‘architecture–urbanism’. Owing to the fundamental significance he attributes to such a ‘twin-phenomenological’ way of designing, the design of spatial ‘in-betweens’ or ‘in-between’ spaces is complemented by other forms of designed twin phenomena. This, however, implies a potential superimposition of that design of ‘in-betweens’ spaces by the application of a rather formal way of design.

Building analysis

The analysis of the various buildings confirms this argument. Firstly, the overall development of Van Eyck’s architecture can indeed be interpreted as oscillating between the creation of spatial ‘in-betweens’ and the formal implementation of a ‘twin-phenomenological’ design approach, particularly by the design principles of ‘part–whole’ and ‘diversity–unity’. In the Orphanage building, the presence of both can be demonstrated along their complementing implementation. The Pastoor Van Ars

Church and the Sonsbeek Pavilion, whose realisation followed the design and construction of the Orphanage, demonstrate a clear focus on space formation and the creation of 'in-between' spaces. The ESTEC and Tripolis projects, however, indicate a clear superimposition of the creation of (the configuration of) 'in-between' spaces by the formal implementation of the twin phenomena 'part-whole'. The Court of Audit in turn exhibits an integration of the latter in the present type of space formation.

Chapter 7. Conclusions

The concluding analysis of Gropius's and Van Eyck's approaches to architectural design and aesthetics deals with the question of whether or not they related space formation (the element or aspect to which they referred) to the perception of space, whether or not they linked the purposiveness and aesthetics of architectural design in different ways, and with what particular concept of architectural aesthetics they did so.

In terms of Gropius, it is argued that such connection is not at all present or possible on the basis of his approach to (the perception of) space nor through his manner of referring to space formation; rather, both the approach and type of reference complement each other in their abstractness—the abstractness on one hand concerning the realm of immediate sensuous perception and on the other hand concerning the realm of the immediate socio-spatial meaning of space formation. Here, this abstractness illustrates Gropius's fundamental abstraction from the immediate social being as well as the concretely spatial existence of man.

The answer to the question of whether or not Van Eyck links the perception of space to space formation is more complicated than in the case of Gropius. It is firstly more complicated since, in Van Eyck's overall approach to architectural design, the immediate socio-spatial meaning of space formation plays a significant role. It is secondly more complicated because this link is present only in an indirect way: in Van Eyck's approach, the moment of perception dissolves in the form of two spatial sensations into an all-encompassing 'interiorization' of space (and time). The sensuous perception *of* space thus transforms into a sensuous (self-)experience *in* space. As a result, the creation of (a configuration of) spatial 'in-between(s)'—thus, architectural space formation—is *not* conceived as an object of aesthetic perception, but rather as a medium of this (self-)experience.

Therefore, both views on architectural design and aesthetics lack an actual concept of the sensuous perception of (architectural) space. Correspondingly, and in different

ways, they both lack a concept of the significance of architectural space's sensuous perception concerning the integration of the socio-spatial meaning of space formation in the aesthetic experience of architecture. Consistent with this lack, neither Gropius nor Van Eyck link the perception of—or experience in—space with the architectural aesthetics realm. By contrast, for both architectural aesthetics concern the design and appearance of architectural form.

Final considerations

What makes Van Eyck's approach so interesting in this respect is that the socio-spatial meaning of space formation nevertheless takes centre stage in his understanding of architectural design and that he explicitly mentions the sensation of spatial enclosure and openness. Owing to a traditional (object-oriented) concept of architectural aesthetics, however, the realm of sensuous perception remains separated from architectural aesthetics and dissolves instead into the realm of (self-)experience *in* space. In this vein, what occurs in Van Eyck's approach is an opposite kind of integration in that the socio-spatial meaning of space formation does not become integrated into architectural aesthetics through the perception *of* architectural space; rather, both the socio-spatial meaning of space formation and the perception—or sensation—of space become integrated into the experience *in* space and into what Van Eyck regards as the fundamental purpose of architectural design: the 'interiorization' of space. As a result, in Van Eyck's approach to (architectural) space, the socio-spatial meaning of space formation is *not* conceived as content that becomes aesthetically effective, but is rather conceived to become directly socio-psychologically and socio-spatially effective.

Despite this contradiction, Van Eyck's approach is so interesting and valuable from the perspective of my thesis of a socio-spatial aesthetics of space formation because it confirms the fact that, without overcoming a mere object-oriented concept of architectural aesthetics, a true integration of the aesthetics and the purposiveness of architecture cannot be realised. This true integration is, or rather would be, one wherein the aesthetics of architecture neither dissolve into nor superimpose the purposiveness of architectural design.

In this context, I point again to August Schmarsow's aesthetic approach to architecture and the involved transcending of a mere object-oriented concept of architectural aesthetics—an approach that also contributes to a more thorough understanding of

how we perceive the socio-spatial meaning of space formation and, accordingly, a more thorough understanding of its integration into the aesthetic experience of architecture.

Finally, the existence of this approach at the very beginning of this century reveals a particular shortcoming within the development of modern architecture in the first half of the twentieth century. The shortcoming of the Neues Bauen (including Gropius) was that its members failed to continue developing the theoretical examination of architectural space and its formation at the beginning of the twentieth century. In particular, its members did not adopt Schmarsow's theory of architecture as 'Raumgestalterin' (the 'creatress' of space); rather, architectural aesthetics remained merely object-oriented, formal aesthetics. At the same time, and as the analysis of Paul Frankl's and Leo Adler's conceptions makes evident, it is a shortcoming that was rooted in the discourse itself.

PREFACE

My interest in the subject of this dissertation was initially stimulated by my study of the design-theoretical and historical writings of art historian and philosopher Max Raphael (1889–1952).¹⁶ His specific approach to architectural space formation, which he combined with a critical examination of contemporary modern architecture, inspired me to investigate architectural space formation as an essential constituent of architectural design. What characterises Raphael's examination of architectural space formation is the specific connection he draws between space formation and construction (the construction principle) as well as the resultant notion of the relatively artistic unity of the bearing, space-enclosing, and space-opening aspects of the architectural built form. Raphael regarded this relative unity as an essential characteristic of architectural production throughout the history of architecture—firstly and foremostly, the architectural history within Europe. Raphael illustrates his thesis based on the Doric temple as well as Romanesque and Gothic church architecture, wherein he identifies various types of space formation as different modes of that relative unity among bearing, enclosing, and opening.

The examination of his writings on architecture influenced my study of various art historians' views on space formation at the beginning of the twentieth century, such as those of August Schmarsow, Alois Riegl, and Paul Frankl. Raphael's work also inspired me to study the related works of Dom Hans van der Laan and architectural historian Julius Gy Hajnóczy, wherein space formation is also conceived and analysed as the main and essential constituent of architectural design. By investigating their theoretical work, however, I realised that both studies are characterised by a rather limited reference to the use-related and socio-social meaning (function) of space formation, which is an aspect that also characterises Raphael's approach; although, within the early twentieth-century discussion of space and space formation, such a reference is very likely to be found.

¹⁶ Raphael 1930, [1933–34] 1976a–d, [1934–35] 1989a,b.

As a result, and with the intention of contributing to a qualification of space formation as a particular constituent of architectural design, my preoccupation with space formation became oriented towards its twofold nature: the form–artistic and aesthetic meaning as well as the use-related and social meaning of the immediate creation and arrangement of physically defined interior and exterior spaces. To this day, such a qualification is missing, although I perceive it a generally accepted fact that space formation implies both meanings.

This orientation has resulted, in turn, in my ambition to develop a concept of space formation by focusing on this twofold nature and linking it with the fundamentally purposive nature of architecture as a visual art. In the scope of a research project funded by the Netherlands Foundation for Visual Arts, Design, and Architecture, this ambition led me to formulate my first corresponding conception of space formation. Within this conception space formation is defined as a three-part interplay between the physical enclosing, opening, and spatial arranging of defined spaces. The conception's development had already been combined with an investigation of existing notions of architectural space, which therefore led to a comparative analysis of Dom Hans van der Laan's and Aldo van Eyck's approaches to space and space formation from the conception's perspective.

Due to this project's scope, I got in contact with Dick van Gameren and the architectural department of the TU Delft. He offered me the opportunity of enlarging this project and converting it into a doctoral dissertation. In turn, this opportunity inspired me to prepare for and embark on an additional research project—one that not only focuses on the twofold nature of space formation and combines this focus with an investigation of historical concepts of architectural space, but also examines both with a broader perspective. Under the very helpful supervision of Dick van Gameren and Tom Avermaete, in his function as one of the leaders of the Department of Architecture's research program at that time, the final subject and orientation of the present dissertation was shaped: by embedding the reference to particular historical concepts of architectural space into the development of modern architecture in the first half of the twentieth century, therefore dealing with Aldo van Eyck as a member of Team 10 and examining Walter Gropius's functionalistic approach rather than that of Dom Hans van der Laan. In this vein, my ambition to combine a design–theoretical focus on space formation with historical research inspired this study's final orientation: the formulation of a new perspective on the concepts and architecture of Walter Gropius and Aldo van Eyck based on a particular concept of architectural space formation.

INTRODUCTION

This dissertation deals with ‘architectural space formation’, understood as that part of architectural and urban design which concerns the creation and structuring of physically defined spaces of inside and outside character, both separately and in relation to each other and to open space. Furthermore, it focuses on the fundamental significance of space formation in architectural design and aesthetics as well as on the question of how Walter Gropius and Aldo van Eyck referred to space formation as part of their approaches to architectural design and aesthetics, separately, compared with each other, and in relation to the concepts of space formation at the beginning of the twentieth century.

In English, the term ‘space formation’ is a neologism; it exists merely as the literal interpretation of the German term ‘Raumbildung’. Accordingly, in the English literature on architecture it is actually not to be found. An exception is the study of Sophia Psarra: *Architecture and Narrative: The Formation of Space and Cultural Meaning*, published in 2009. In the German language, however, it has been remained a familiar concept in architectural discourse since the end of the nineteenth century. To this day, it is quite natural among German-language architects and theoreticians to speak of ‘Raumbildung’—as defined above—as a (fundamental) category of architectural design, as well as to refer to the given ‘Raumbildung’ of a particular building or (urban) building structure. Within the English language, the phenomenon of the creation of physically defined spaces has instead been addressed as either the ‘defining’ (Ching 1979) or ‘organization’ (Unwin 1997) of space.¹⁷ Over the last five decades, and whether or not explicitly named as such, the phenomenon of space formation in

¹⁷ For the English-speaking reader, the term ‘space formation’ may sound rather strange. Therefore, space formation will be regularly specified as ‘architectural space formation’. The original German term, however, is not used since this would detract from a fluent reading of the text.

architecture has been discussed in different ways. First, and mainly apart from the German-language area, it has appeared in several educational books that explain the basic artistic principles of architectural design (Ching 1979, Von Meiss 1986, Unwin 1997, Janson 2006). Here, the examination of space formation concentrates on classifying various space-defining and structuring elements and the corresponding ways of bringing architectural space into being, starting with the differentiation of the ground in the vertical direction. Furthermore, different kinds and grades of enclosing, opening, and arranging defined spaces are discussed (both separately and in combination with one another), as well as other aspects of space formation like the shape, depth, density, and stratification of space, and the interpenetration of defined spaces (both in relation to each other and to open space). Of the abovementioned authors, it is Pierre von Meiss (1986) who most explicitly touches on the use-related and socio-spatial meaning of space formation, although he does so in a rather general way:

*The walls and the vertical structure are there to carry the ceiling and roof, guide our movements and activities, our objects and tools, accommodate us and lead us from one place to another. Walls separate and structure architectural space; they demarcate, protect and by this fact enable to inhabit.*¹⁸

Next to these examinations of space formation as part of overall discussions of architectural design, in other primarily German-language studies, architectural space takes centre stage (Ungers 1963, Joedicke 1968, 1985, Van der Laan 1977, Meisenheimer 1978, 1984, Hajnóczy 1988, Schubert 2016). With the common aim of developing a fundamental concept of architectural space and its formation, these studies (like the aforementioned publications) primarily deal with architectural space at the level of its physical condition and as a synthesis of solid forms and ‘empty’ space. This means that the architectural built form is discussed as solid, or as a more or less close or wide arrangement of several solids. Here, the solid form is addressed as the ‘*positive, forming part of architecture*’, and the space between as the ‘*unformed, the negative part*’, as Oswald Mathias Ungers puts it.¹⁹ It is addressed as the massive solid from which the hollow void results (Van der Laan 1977). Furthermore, the solid form is addressed as physical, space-limiting boundary (Schubert 2016): as the boundary by which ‘*solid and space are both separated from and connected to one another*’.²⁰ As the space-forming shape, it further gets differentiated in terms of its own spatial extension and

¹⁸ Von Meiss, 1990, 129.

¹⁹ Ungers, 1963, 43. In Peter Eisenman’s dissertation: *The Formal Basis of Modern Architecture*, also published in 1963, we find a similar distinction between positive inner volume of space (space-enclosing form) and negative outer volumes of space (spatial distance between form the space-enclosing forms).

²⁰ Schubert, 2016, 12.

corresponding space-forming potential (Van der Laan 1977): *The form of the wall stems from the interaction of linear measures in various directions; but the form of the space is brought by a mutual neighbourhood that involves the dimension of the walls and their distance apart.*²¹ Ungers distinguishes in this regard between space-limiting cube, surface, and linear element, mentioning the ‘pillar, cornice, tie or strut member, pipe or tensioning rope’²² as possible linear space-forming elements. By referring to space as a void, or as a structure of voids, in shape and dimension defined by solid bodies, their surfaces, and the continuous or implicitly defined boundary, such (hollow) void is additionally discussed as an interval between solids and material surfaces, as (open) field (Joedicke 1984) or area (Ungers 1963). Van der Laan eventually discusses the void also in its proportional relation to the space-defining form: *Both the disposition of the wall and of the space go hand in hand. They happen in two consecutive orders of dimension and go along with one another as two melodies that differ in pitch and octave.*²³

The work of Hungarian historian of architecture Gy Hajnóczi (1988) and of the German architect Karsten Schubert (2014) differ from the other three studies in their attempt to discover an overall systematization of all possible kinds or types of formed space. In Schubert’s study, this approach leads to a quite extensive differentiation of fundamental space types on the basis of the spatial composition of the vertical space-defining surfaces. Space types that are more or less defined in terms of shape, limitation, and structure here represent different qualities of discrete or just indiscrete space. Hajnóczi, in turn, develops a far-reaching differentiation in various kinds of so-called main spaces in between the different space-shaping forms, and subspaces within these forms resulting from various passages between the various inside and outside spaces. Furthermore, his systematization includes the space-forming effect of the concave and the spatial effect of the convex character of the various space-forming elements.

Despite the extent of systematization, a common feature of these studies that centre on architectural space is to effectively leave the use-related and socio-spatial meaning of space formation aside. Furthermore, they refer to the realm of the sensuous perception of architectural space, and thus to the aesthetics of space formation, if at all in a rather general way. Here, it is Jürgen Joedicke (1985, 9–10, 21–23), who, in his examination of space formation, most clearly points to the sensuous perception and resultant subjective experience of space, including the moment of time-related movement. Also, Dom Hans van der Laan (1977) explicitly includes the perspective of man in his theory on architectural space. He does so, however, in a

²¹ Van der Laan, [1977] 1983, 36–37.

²² Ungers, 1963, 42.

²³ Van der Laan, 1977, 166.

rather idealistic and generalizing way, defining three principal ways of how man ‘appropriates’ space: physically, visually, and mentally (Van der Laan 1977, 23–79). Concerning the physical appropriation, he neglects any social condition of human life and correspondingly any socio-spatial meaning of space formation. Concerning the visual and mental perception of space, he actually does not touch the sensuous perception of architectural space but rather focuses on its intellectual, rational recognition by means of identifying the physical dimensions of solids and voids. In his classification of various kinds of formed spaces, Gy Hajnóczy includes the perceiving human being in a more concrete way. First, he does so by differentiating between three general horizontal layers of space in accordance with their vertical distance to the human subject, referring to this layering as the general context within which the classification of spaces is situated. Second, he sees the specific position and visual orientation within a particular space as a category in the systematization of space formation. Although he takes, in this way, the concrete subjective perspective of man on the formed space into account, he refers to this perspective as one category within the overall systematization of space formation.

As a result, in all these studies on architectural space, the purposive (i.e. use-related and socio-spatial) meaning of space formation is addressed in a rather marginal way. Also, an aesthetic examination of space formation is neglected, that is, to discuss space formation in terms of artistic expression and sensuous perception. This neglect distinguishes these studies from the discussion of architectural space and space formation as it developed at the end of the nineteenth century and the beginning of the 20th. Here, both the question concerning the sensuous perception of architectural space as well as that of the purposive, practical meaning of space formation played a determining role in the theoretical preoccupation with architectural space and its formation (Schmarsow 1894, 1905, 1921, Frankl 1914, Sörgel 1921, Adler 1926).

Since the 1980s, several other studies have quite successfully approached architectural space from a use-related and socio-spatial perspective (Hillier and Hanson 1984, Feldtkeller 1989, Hertzberger 1996, Hillier 1996, Van Gameren 2006). In comparison with the aforementioned educational books and the explicit theories on architectural space, these studies focus on architectural (and urban) space in terms of its individual and collective use and appropriation, including the moment of use-related orientation and movement in space, and partially also in connection with its perception. These studies include, in various ways, references to space formation, although this reference is only implicit. Christoph Feldtkeller (implicitly) focuses on particular aspects of space formation, directly dealing with the aspects of separating and relating spaces. However, he does so by explicitly negating architectural space as an artistic (aesthetic) reality. Therefore, he refers to both aspects only in use-oriented

and technical terms, thereby not separating and relating defined spaces but areas with a certain use-related and socio-spatial function. Also, Bill Hillier and Julienne Hanson (implicitly) refer, in their space-syntax theory, to a particular aspect of space formation: that of the spatial configuration of spaces. But since they refer to architectural space only in terms of voids and spatial areas, more or less neglecting the immediate space-forming quality of the building's material shape, the form-related identity of architectural space and its formation is not discussed. Herman Hertzberger's and Dick van Gameren's studies do not refer to a particular constituent of space formation. They (implicitly) refer to space formation in a general and descriptive way, discussing instead the various kinds of spatiality and the implied use-related and socio-spatial qualities. Here, it is Herman Hertzberger who most approaches (the creation of) architectural space from the perspective of its daily use. Dick van Gameren, in turn, does so from the perspective of the use-related movement through space. By so doing, he most links—via the concept of movement—use and perception of space.

Although the various contributions provide comprehensive insight as to the use-related and socio-spatial meaning of space formation, they either do not reflect on space formation itself, or do so in an implicit way. In comparison with these references to (aspects of) space formation from a clear use-related and socio-spatial perspective, the reference of Sophia Psarra (2009) to space formation differs in discussing space formation in an explicit and, at the same time, conceptual way. In continuation of Hillier's and Hanson's studies, she also refers to space formation exclusively in terms of the configuration of spaces. Here, she particularly examines—and provides insight into—the potential of the configuration of spaces to realise and convey social and cultural meanings. Meanings that she believes are communicated by experiencing the spatial configuration in the state of moving through it.

In relation to all these described discussions, theories, and (implicit) references to architectural space and (aspects of) its formation, the first concern of this dissertation is to centre on space formation itself, and to thereby add to the existing knowledge a more concrete understanding of the artistic and aesthetic significance of space formation within architectural design and aesthetics. Taking up the use-related and social perspective on architectural space of the previously mentioned studies, the present research takes as its starting point the assumption that this significance first lies in the purposive (i.e. use-related and social, or socio-spatial) meaning of space formation to create defined spaces for particular and various uses and forms of appropriation. Furthermore, the significance lies in the corresponding quality of space formation to separate and connect spaces with one another and with the open space

through their physical enclosing and opening, as well as through their spatial arrangement, or configuration. In this vein, I regard space formation as representing an essential means for the spatial organization of practical and social life. Secondly, this research departs from the assumption that space formation also represents the constituent of architectural design that characterises architecture as a visual art and epitomizes its aesthetic quality, that is, the quality of architecture to generate a particular aesthetic experience.²⁴ My contribution to a more concrete understanding of space formation, of its significance within architectural design and aesthetics, is now oriented towards the question of how—at the space formation level—the (use-related and socio-spatial) purposiveness of architectural design and its aesthetic experience are related. This orientation has resulted in the elaboration of a particular theory on space formation: the thesis of the socio-spatial aesthetics of space formation, which I explain in Chapter 1.

The dissertation's second concern is to combine this design-theoretical focus on space formation with historical research and to investigate Walter Gropius's and Aldo van Eyck's approaches to architectural design and aesthetics from the perspective of this thesis. Here, I refer to Gropius as a protagonist of the so-called 'Neues Bauen,' and to Van Eyck as a protagonist of Team 10. The reason for particularly focusing on Gropius and Van Eyck is motivated by the fact that they likewise approached architectural space from a use-related (Gropius) or a socio-spatial (Van Eyck) perspective, which played a decisive role in their overall approaches to architectural design. Furthermore, both perspectives also include a clear reference to space formation, although this reference is implicit in several ways. Most importantly, however—and different from the aforementioned studies of Hillier and Hanson, Feldtkeller, Hertzberger and Van Gameren as well as the approaches of all other protagonists of the Neues Bauen and Team 10—Gropius's and Van Eyck's approaches include a theoretical examination of the concept of space within which the perception of space, that is, the individual human perspective on space, plays a pivotal role. This last difference is highly significant, since in my thesis of the socio-spatial aesthetics of space formation, the moment of the individual, sensuous perception of space plays a decisive role concerning the abovementioned relationship between the aesthetics and the purposiveness of architectural design at the space

²⁴ In this dissertation, the term 'artistic' is exclusively used in the sense of the German adjective 'gestalterisch', and, hence, in a design-related meaning. It is not used in terms of art (and corresponding concept of aesthetics), qualifying a particular kind of designing as 'künstlerisch'. The term 'aesthetic', in turn, is used as soon as architecture and its design are approached from the perspective of its sensuous perception and experience. For a clarification of my use of the term 'space' and 'aesthetic experience' see: Chapter 1, 1.1 The socio-spatial aesthetics of space formation.

formation level. Therefore, carrying out research on their theoretical positions seems to me the most promising way to investigate other use-related and socio-spatial approaches to architectural space from the perspective of a socio-spatial aesthetics of space formation. Here, this investigation focuses on both their specific references to space formation,²⁵ and on their respective approaches to the perception of (architectural) space. Furthermore, I investigate whether and how they relate space formation and spatial perception to each another, and whether and how space formation and the associated purposiveness of architectural design are related to architectural aesthetics in a different way.²⁶

The underlying ambition in combining design-theoretical argumentation with historical research is to firstly position my thesis of the socio-spatial aesthetics of space formation in a broader theoretical and historical context. Secondly, this provides me with the opportunity to critically and comparatively investigate Gropius's and Van Eyck's approaches towards architecture from a new perspective. In addition, both can be positioned in relation to the examination of architectural space and space formation as it developed at the end of the nineteenth and the beginning of the twentieth centuries. From this contextualisation, conclusions may in turn be drawn regarding the development of how architectural space and space formation has been approached and understood in the first half of the twentieth century.

Structure

As an extensive introduction, Chapter 1 begins with the theoretical assumptions that form the basis of my analysis of Gropius's and Van Eyck's approaches to architectural design and aesthetics. First is the thesis of the-spatial aesthetics of space formation. Its explanation begins with a clarification of the terms 'aesthetic experience' and 'architectural space', and with a definition of how I refer to space formation in this thesis—namely as an interplay of three fundamental constituents, which are the

²⁵ Instead of referring in my investigation to different 'concepts' of space formation, the term '(implicit) reference' is chosen. This is done, because neither Gropius nor Van Eyck explicitly dealt with space formation as an independent subject of architectural design and accordingly also did not use the term 'space formation', at all. Both acknowledged and dealt—in different respects—with the self-evident reality of architectural space and the corresponding design-related significance of arranging, enclosing, and the opening spaces.

²⁶ In Chapter 1, the selection of Gropius and Van Eyck as well as the methodological approach of my investigation, including the research questions, is explained in detail. See: Chapter 1, 1.2 Basic Approach and 1.3 Research Question and Methodological Approach.

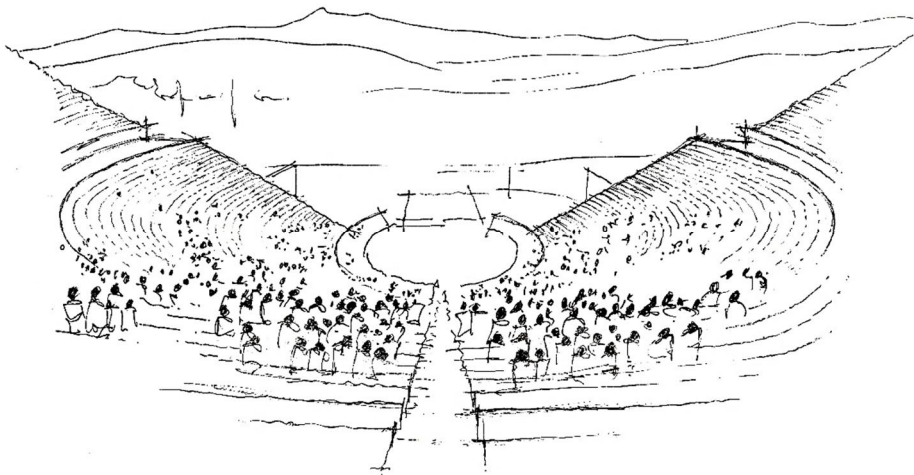
physical enclosing and opening of defined spaces, as well as their spatial arrangement or configuration. On the basis of this clarification and definition, space formation is discussed in relation to its use-related and socio-spatial meaning(s). The following, more detailed clarification of the concept of aesthetics, in turn, offers me the opportunity to distinguish more clearly between the relationship between the use-related and socio-spatial purposiveness, or, rather, the meaning of space formation on the one hand and the realm of aesthetics on the other.

The second part of Chapter 1 concerns the basic approach of this study. Here, the general context of Gropius's and Van Eyck's approaches to architectural design and aesthetics is first explained, meaning how architectural design (and aesthetics) was approached from a use-related and social perspective within the 'Neues Bauen' and Team 10. Subsequently, the specific details of Gropius's and Van Eyck's approaches within this context, and what qualifies them in particular as research subjects, are discussed. This is followed by the clarification of the actual research questions, the methodological approach, and concluded with a discussion of the relevance of my approach in the context of existing research on Gropius and Van Eyck, and the examination of architectural space and space formation at the beginning of the twentieth century.

In Chapter 2, space formation again takes centre stage. Prior to the discussion of Gropius's and Van Eyck's positions, the various references to space formation within European architecture from the Renaissance period up to the beginning of the twentieth century are summarized. In this part of the dissertation, I want to illustrate how space formation has always been present in the consciousness of architects and architectural theorists - be it in an explicit or implicit way. Furthermore, I want to illustrate that not later than in the 1920s, space formation was generally recognised as an essential feature of architectural design, both in purposive and aesthetic terms. Then, with the intention of contextualising both my thesis and the analysed positions of Gropius and Van Eyck, three particular approaches to space formation from the beginning of the twentieth century are discussed in detail: those of art historians August Schmarsow (1853–1936) and Paul Frankl (1886–1958) and that of architect and architectural theorist Leo Adler (1891–1962). This selection of authors is based on their attention to space formation both in purposive and aesthetic terms, and that which distinguishes them within the various views on architectural space and space formation as it developed at the end of the nineteenth and the beginning of the twentieth centuries. This Chapter ends with an evaluation of their theories from the perspective of the socio-spatial aesthetics of space formation that particularly highlights the fundamental value of Schmarsow's approach for a perception-oriented concept of architectural aesthetics.

The Chapters 3 and 4 deal with Walter Gropius: First, with his approach to (the perception of) space and then with his (implicit) reference to space formation. This order results from the fact that Van Eyck's reference to space formation essentially results from his general concept of space, largely determining his general approach to architecture. The corresponding examination of Van Eyck's reference and approach in the subsequent Chapters 5 and 6 logically follows the same order. A first comparative analysis with other protagonists of the Neues Bauen and Team 10 is limited to the analysis of Gropius's and Van Eyck's approaches to (the perception of) space. A second comparison explores the relationship between Gropius's and Van Eyck's positions and is completed by a comparison with August Schmarsow's approach to (the perception of) space. In this vein, the conclusions of the Chapters 2, 3, and 5 form a continuous line that successively evaluate Gropius's and Van Eyck's approaches to (the perception of) space.

In the concluding Chapter 7, the findings of the previous Chapters are brought together and my analysis of their approaches to (the perception of) space and references to space formation is concluded by returning, as it were, to my thesis of the socio-spatial aesthetics of space formation and the stated relationship between the socio-spatial meaning of space formation and the sensuous perception of space. Accordingly, this Chapter focuses on the issue of whether or not Gropius and Van Eyck related space formation (the element or aspect to which they referred) to the perception of space. In addition, their concepts of architectural aesthetics are discussed, followed by some final considerations. These considerations also concern the development of how architectural space and space formation has been approached and understood in the first half of the twentieth century.



Theatre Epidaurus (4th century BC)

1 THEORETICAL ASSUMPTIONS, BASIC AND METHODOLOGICAL APPROACH AND RELEVANCE

1.1 The Socio-Spatial Aesthetics of Architectural Space Formation

Aesthetic experience and architectural space

In the formulation ‘the socio-spatial aesthetics of space formation,’ the concept of ‘aesthetics’ is used to describe the artistic potential of architectural space formation to provide a particular aesthetic experience.²⁷ Here I use the term ‘aesthetic experience’ in a narrower sense than has been developed and discussed in the recent discourse on aesthetic experience (Seel 2003, Küpper/Menke, 2003, Brandstätter 2008, 2012). There, the concept of aesthetic experience is explained and discussed in terms of ‘ästhetische Erfahrung’, which integrates experience as a means of knowledge and self-experience. Furthermore, in this discourse, the examination of aesthetic experience also includes the realm of artistic production as a medium of (epistemological) experience, thereby referring to sensuous perception in both a receptive and productive sense.

In my research, I do not use the term ‘aesthetic experience’, however, in relation to the act of designing and in any epistemological sense. In contrast, I solely employ this concept to describe the experience of the built environment by means of its sensuous perception at the moment of residing in and moving through it. In this

²⁷ Concerning how I distinguish between the terms ‘artistic’ and ‘aesthetic’, see: Introduction, page 48.

sense, I use the term ‘experience’ less in its German meaning of ‘Erfahrung’ but rather in its meaning of ‘Erleben’. However, also in this sense, ‘experience’ (potentially) includes a simultaneous awareness of both that which is being perceived and the experience itself.

Similarly to the indefiniteness of the terms ‘aesthetics’ and ‘aesthetic experience,’ the term ‘architectural space’ allows for multiple interpretations of its meaning. For instance, ‘mental space’ or ‘social space’ are two concepts of space that also have been used in direct relation to architecture (Boudon 1971, Lefebvre 1974). In my thesis on space formation, I use the concept of ‘space’ exclusively in terms of what has been described in sociological theory as ‘physical space’ in order to distinguish a ‘social space,’ the ‘space’ of social life, and socio-economic reality (Lefebvre 1974, Bourdieu 1991, Löw 2003). Philippe Boudon (1971) refers to it as ‘real space’ in order to distinguish a ‘mental space’—the ‘space’ of thinking and imagination.

In line with the aforementioned studies of Oswald Mathias Ungers (1963) and Jürgen Joedicke (1985), this includes the understanding of architectural space as consisting of a space-form synthesis: a unity of what appears to us as (a section of) ‘empty’ space²⁸ and the solid shape(s) that brings this particular section—and its connection to other sections of space—into being. At the same time, my reference to architectural space as a space-form synthesis differs from both Ungers’s and Joedicke’s studies, in which they refer to the phenomenon of a material enclosing and opening of space. Although Ungers speaks of ‘open limitation’ and ‘enclosed envelop’ as the two essential possibilities of space formation, for him, as for Joedicke, it is the definition of two different kinds of architectural space that takes centre stage.²⁹ Here, the phenomena of enclosing and opening disappear, as it were, behind the conceptions of space as an (enclosed) volume, on one hand, and an (open) field (Joedicke) or area (Ungers) on the other. This, however, erases the identification of the enclosing and opening of space as both creative and purposive acts (or operations), or, rather, as the result of such operations. This is also based, of course, on the neglect of the socio-spatial meaning of space formation.

By contrast—and informed by the use-related and social perspective on architectural space formation—the moment of material enclosing and opening takes centre stage in my understanding of architectural space as a space-form synthesis. I look upon enclosing and opening as the two moments of built form that effectively embody the use-related and social (or socio-spatial) meaning of space formation: The moment of enclosing necessarily determines the size and spatial form of a defined

²⁸ Although ‘empty space’ does not really exist, the adjective ‘empty’ makes sense as we indeed perceive space in terms of spatial distance between visual objects in this way.

²⁹ Compare: Introduction, page 44-45..

space, as it implies the separation from, and the creation of distance to, surrounding space. The moment of opening, in turn, implies the immediate relating of defined spaces with one other, thus the creation of proximity. Furthermore, I refer to the (act or operation of) physical enclosing and opening, of separating and connecting space, as two constituents of a three-part interplay, which also includes the spatial arrangement of defined spaces in relation to one another and to open space—hence, their configuration within a given spatial context.

The interplay of enclosing, opening and arranging spaces

To begin at the very basic level of space formation, which I regard as the first fundamental constituent of the interplay of the enclosing, opening, and arranging spaces, is the creation of an (at least partial) physical enclosure of a particular section of ‘empty’ space. It is by means of this enclosing that space receives a certain representational, object-like character and becomes, depending on the degree and type of enclosing, more or less distinguished and physically separated from the surrounding space. Furthermore, the moment of enclosing includes the definition of the size and outline and the definition of the proportion between the horizontal and vertical extensions. The spatial shape and the implied proportions—and the resultant orientation in a horizontal and/or vertical direction—generate a certain spatial dynamic, which is characteristic of the defined space itself.

However (and leaving the case of a completely enclosed and inaccessible space, such as a tomb or a cave, as an exception to the rule aside), the physical enclosing and separation of space are always of a relative nature. The degree of enclosing and the resultant physical separation are always limited, which means that the defined space remains connected with the surrounding space. The limitation of enclosing—whether it results from the outline of the shape, from the spatial distance between different shapes, or is realised by means of physical openings within a shape—always generates an opening of the defined inside or outside space and a corresponding spatial relation with the surrounding space.³⁰ I refer to such a physically generated opening, and the resulting spatial relation, as the second basic constituent of space

³⁰ In order to keep the use of terms as simple as possible, in this study I generally distinguish between ‘inside space’ and ‘outside space’ as the two fundamental modes of physically defined space in architecture (and urban design). ‘Inside space’ here describes the kind of architectural space to which we traditionally refer as the interior of a building, whereas ‘outside space’ describes the kind of architectural space that is characterised by its exterior condition, and thus, its direct connection with open space.

formation. In this sense, I refer to any architectural (and urban) space as characterised by its dual physical-spatial nature: being both enclosed *and* open; separated from as well as connected to the surrounding space, be it in a direct or visual way. The interplay of these two constituent moments of space formation may range from a very high to a very low grade of enclosing, from a very high grade of separation from the surrounding space to a very high grade of connection, from a completely enclosed cellar vault with only one solid door to an open square enclosed only in a minimal way. Regardless of how small the degree of enclosing may be, however, the space-defining element(s) always surround(s) space, be it in such a rudimentary way as in the case of a curved garden wall or a flat roof construction carried by slender pillars. Together, enclosing and opening generate an additional spatial dynamic, different from the one generated by the enclosing on its own. It is a dynamic that, in my opinion, results from a specific ‘Innenräumlichkeit’ (enclosed spatiality), generated by the kind of enclosing and separation from the surrounding space, and a particular ‘Aussenorientierung’ (outside orientation), generated by the kind of opening and the resultant connection of the enclosed space with the surrounding space. Both ‘enclosed spatiality’ and ‘outside orientation’ – thus a specific dynamic generated by their interaction – can be attributed to both inside and outside spaces as defined above.

The third basic constituent of space formation, which I wish to point out, is the spatial arrangement of defined inside and outside spaces in relation to one other and to the surrounding open space. It automatically becomes part of space formation as soon as we are concerned with the formation of more than one defined inside or outside space. Within the three-part interplay of the enclosing, opening, and arranging spaces, the spatial arrangement of spaces forms the abstract basis of the actual material manifestation of architectural space, which is realised by means of the material enclosing and opening of space. By means of their spatial arrangement, defined spaces are separated from and related to one another in a different, namely pure *spatial* way.

Space-forming Structure

Next to identifying space formation with such an interplay, the following argument of my thesis is that any space-forming interplay of the enclosing, opening, and arranging spaces (conceived as an artistic and purposive operation) results in a built structure consisting of floors, walls, roofs, etc. In being the result of such an interplay, this built structure indeed represents a space-forming structure with particular, materially defined spaces and spatial relations—whether it is the case of a single

building or a configuration of several buildings. As soon as we are concerned with the creation of more than one single space, this space-forming structure comprises (the formation of) several, physically defined inside spaces in relation to one another and to open space. Then it also (potentially) includes defined outside spaces of particular grades of enclosure, as well as inside-out zones between defined inside and outside spaces and between them and open space. The extent of the space-forming structure particularly depends on the presence of defined outside space. In this sense, the built structure of an entire city could potentially represent a continuous space-forming structure. At the same time, we can focus on a particular part of a larger built structure and refer to this part as a separate space-forming interplay of the enclosing, opening, and arranging spaces. The complexity of the space-forming structure depends on the particular number and form of the given inside and outside spaces. It also results from the arrangement of such spaces—whether they are being arranged next to, above, or within one other—as well as how they are materially separated from and connected to one another.

Finally, as a space-forming structure, any built structure represents a network of various kinds of ‘Innenräumlichkeit’—of enclosed spatiality, and various kinds of ‘Aussenorientierung’—of outside orientation. However complex this network of the space-forming structure may be, it always ‘operates’ between the two extreme forms of formed space: within a maximum of enclosed spatiality and separation *from* open space, and a maximum of outside orientation and connection *with* open space.

In this sense, my definition of architectural space formation is characterised by dealing with architectural space not solely in terms of a discrete self-contained entity. Instead, it necessarily includes the spatial relationship of several defined spaces with one another and with the surrounding space. It is this specificity of space formation in creating spaces *in relation* to one another and to open space that also leads to the particular use-related and socio-spatial meaning of space formation and, ultimately, to its socio-spatial aesthetics.³¹

³¹ Defined as a three-part interplay as such, space formation coincides to a certain extent with what is generally described as the (spatial) composition of a particular architecture (compare: Janson 2014, 65–66). In the components of physical enclosing and opening, however, space formation additionally includes the three-dimensional form and the material (constructional) composition of the various space-shaping elements (for instance, their thickness or transparency) as a means of design. Moreover, the term ‘composition’ implies a focus on the spatial appearance of architectural form, by which the space-forming identity—particularly the moment of opening and relating spaces to one other—takes a backseat. For these reasons, the term ‘spatial composition’ is not used in the present study.

With the thesis of the-spatial aesthetics of space formation, I want to investigate whether and how space formation - as defined above - relates the (use-related and socio-spatial) purposiveness of architectural design and its aesthetics. Here, I essentially argue that they are interrelated in a twofold way, which essentially qualifies the aesthetics of architecture as socio-spatial aesthetics. As a part of this interrelation, so I hold, the socio-spatial meaning of space formation becomes an integrated part of architectural aesthetics. This integration particularly takes place at the level of spatial perception, that is, by means of the perception of architectural space. In the following, this argument is explained in greater detail in three steps.

The use-related and socio-spatial meaning of architectural space formation

The starting point of the present study on space formation has been the assumption that, next to its aesthetic meaning, the significance of space formation as a constituent of architectural and urban design lies in its purposive (i.e. use-related and social, or socio-spatial) meaning to create defined spaces for particular and various uses and forms of appropriation. I distinguish between a concrete use-related and general socio-spatial meaning, with the first related to concrete human activity and (inter-)action and the latter related to the social and socio-psychological appropriation of space.

A first aspect of the use-related meaning of space formation, which I wish to point out, is its basic quality of accommodating activity and (inter-)action within a particular defined volume of space. The creation of a usable and accessible floor area is the first and most basic step, which is followed by the definition of that space by its physical enclosure. The second aspect of the use-related meaning of space formation is the separation of a section of space from the surrounding space, as well as from environmental effects and other activity and (inter-)action. Third, the opening of a defined space and the resultant connection with surrounding space can also influence in positive and negative ways use and (inter-)action: as a window, the opening allows for bringing light (and air) into a given space; as a door, the opening makes that space accessible. Both meanings are, of course, charged with a certain ambivalence.

The creation of a single space, with its enclosing shape and openings, already relates this space to the surrounding space in terms of use. Yet, space formation deals with relating use-related activities and (inter-)actions, especially when it concerns the creation of more than one space, or the physical or spatial differentiation of one

space in separated zones. In this regard, space formation receives the meaning of providing a structure of spaces (or spatial zones) for the realisation of various kinds of activity and (inter-)action. Separation then aims at generating a structure of distinct areas of use; as the opening of space and the creation of visual and real connections aim at connecting the same or different kinds of use and corresponding areas. Both are, of course, also functions of the spatial arrangement of these spaces, as spatial proximity and distance also determine the connection between, or separation of, similar or different activities in different areas. In this sense, physical enclosing, opening, and spatial arranging of space complement one another in separating and relating space, and, hence, use-related areas, in a spatial and physical way and in horizontal and vertical directions. Similarly to the physical-spatial level of space formation, also at this purposive level, the spatial arranging of spaces is related to the realisation of use-related activity and (inter-)action in a more general way: namely in terms of the spatial organization of same and different kinds of use in relation to one another. In this regard, the spatial arrangement of spaces, or spatial zones, includes another aspect of the use-related meaning of space formation: the spatial ordering or structuring of use.

With respect to the actual socio-spatial meaning of space formation, the use-oriented provision of (a structure of) spaces imply the socio-spatial appropriation of particular locations in space. Although such appropriation—be it for private, collective, or public use—is eventually realised by the corresponding activity and (inter-)action taking place at this location, it is the presence of an accessible area and its physical separation from the surrounding space that enables its realisation. Next to this, physical enclosing and separation encompass the creation of a protected area, safeguarding the persons involved not only in climatic but also in social and psychological terms. The latter holds true not only for private residential spaces. Although the dwelling (the private appropriation of space) is generally associated with the quality of providing protection and with being a place of individual freedom, the same can be attributed in different grades and meanings to collective or public spaces. This particularly concerns use that includes involvement and concentration, such as teaching or other kinds of gatherings. In addition to the moment of protection, the enclosing and separation of space imply the moment of inclusion, of bringing people together at a particular place for a certain purpose. The most illustrative example of this socio-spatial meaning of space formation is probably the stadium. At the same time, protection necessarily implies the generation of exclusion. This can be seen in the case of the prison, where the socio-spatial meaning of physical separation in terms of generating protection while simultaneously enabling exclusion becomes evident. Here, the meaning of protection and freedom is oriented to the outside as

confinement and exclusion is oriented to the enclosed and separated inside. In this sense, the potential of space formation to create and enable spatial distance and proximity between human beings, implies a distinct socio-spatial meaning, enabling or preventing, for instance, direct communication between persons.

In comprising the described use-related and socio-spatial meaning(s), space formation forms an integral part of practical social life. Moreover, it is particularly through the formation of spaces, separately and in relation to one another, that architecture is a social action itself. It is an action that enables, frames, and partially determines use-related activities and other social (inter-)actions. The example of the prison illustrates the relative significance of space formation in this respect. It also illustrates how meaning depends upon the social and cultural context in which it takes place, within which it is embedded.

In this vein, space formation forms - so the following argument - an intrinsic part of human life and its socio-spatial organization. Spatial separation and distance, along with spatial connection and proximity, are, as a matter of principle, constituents of the fundamental (physical-) spatial condition of human and social life. The same can be said for the moment of appropriation of particular places and the corresponding spatial manifestation of inclusion or exclusion. Georg Simmel (1848–1918) discussed social reality in terms of its spatial condition (Simmel, 1903-a, 1908), referring to (physical) space both as the fundamental condition and the formal manifestation of the social reality of human life.³² Focusing on community life, he identifies the corresponding potential of space with five basic qualities of space *‘on which the modes of shaping community life count’*.³³ First, he names the fundamental quality of *‘Ausschliesslichkeit’* (exclusiveness) of space—this is the singularity (individuality) of a specific location in space and the resultant social quality of identifying this location with a specific social content, for instance, appropriating it as a place of living. Second, he points to the fundamental quality of space to enable the limitation of that place or of a certain socially defined area. In this respect, he also refers to the socio-psychological quality of (physical-) spatial wideness or narrowness as well as the correspondingly potential of a more or less *‘soziale Eingrenzung nach innen’* (social

³² Although space has, particularly in the last 40 years, been addressed by sociological and other related theory from a social and socio-economic perspective (Lefebvre 1974, Konau 1977, Hamm/Jalowiecki 1990, Bourdieu 1991, Löw, 2001), it was Georg Simmel (Simmel 1903-a, 1908) who, to this day, has most prominently broached the issue of the general physical-spatial identity of social life (also compare: Strassoldo 1992, Glauser 2006). Moreover, since his remarks on the fundamental spatial condition of human and social life confirm the corresponding socio-spatial meaning of space formation, I here refer to Georg Simmel in order to exemplify this meaning.

³³ Simmel 1903-a, 2.

localisation and inside-orientation). The third social quality of space for Simmel is the moment of 'Fixierung' (fixation), or the potential to spatially fixate particular social values in space. Fourth, he notes the quality of spatial distance and proximity, and finally, describes the quality of enabling 'Ortsveränderung' (locomotion) of an entire community or of parts within a given community.

Although Simmel himself discusses the social condition and reality of human life at a rather abstract level (Strassoldo 1992) and does not refer to direct forms of social (inter-)action (Konau 1977, 56–58), in his work he succeeds in illustrating the general *spatial* condition of the social being of man. What makes Simmel's remarks so interesting in the context of the present examination of space formation, however, is that they implicitly confirm the identification of the described socio-spatial meaning of space formation. Although Simmel does not deal with space formation itself, his identification of, for instance, the spatial limitation of a certain socially defined area as a basic social quality of physical space implicitly points to the corresponding socio-spatial meaning of the limitation of a defined section of space by means of its physical enclosing. His identification of spatial distance and proximity as social qualities of space, in turn, implicitly points to the socio-spatial meaning of space formation to generate and enable spatial distance and proximity between humans. As a result, his remarks implicitly confirm that space formation forms an integrated part of social life.³⁴

The 'objectification' of the socio-spatial meaning of space formation

As an integral part of social life, the specificity of architecture is that it, in my opinion, 'objectifies' the socio-spatial appropriation of a particular location in space, as it objectifies the creation of socio-spatial distance and proximity. With the term 'objectifies' I mean that the condition of appropriation, that distance and proximity (and the corresponding meaning of space formation) become manifest and expressed in physical shape. More precisely, it is the built structure as a structure of materially defined spaces and spatial relations, in which both become 'objectified' (*vergegenständlicht*). In this sense, the built structure of a given architecture not only to enable the socio-spatial appropriation of a particular place, as stated earlier. In addition, it 'objectifies'

³⁴ In recent times, Simmel's sociological approach to, and examination of, space has been repeatedly criticised as having prevented a real *social* concept of space (Läpple 1991, Löw 2001). Andrea Glauser (Glauser 2006) convincingly disproves this criticism and demonstrates the relevance of Simmel's approach to the contemporary discourse on space in sociology.

the real or potential appropriation, as it makes manifest and expresses the creation of spatial distance and proximity. In terms of the latter, Simmel (1903-b) also points, for instance, to the '*aesthetic value*'³⁵ of a bridge as concretising the purpose of connecting separate banks and associated spaces in its physical presence; similarly, he refers to the aesthetic value of a door as concretising—in contrast to the window—its fundamental socio-spatial purpose of connecting *and* separating inside and outside, private and general space.

Although socio-spatial and use-related meanings are linked to one other, as explained above, an essential difference between them is that the concrete activity-related meaning of space formation is objectified in the material shape of buildings merely in an indirect and abstract way, while particularly the socio-spatial meaning of distance and proximity is directly expressed. The activity-related meaning is rather demonstrated than expressed by means of the real or imagined activity, taking place in or in relation to a particular space and space-forming structure. If we compare the perception of a particular space in an unfurnished and furnished condition, this dependence becomes evident: as soon as furniture is present, the purpose of the space becomes concrete. Without furniture, it remains more abstract. The appropriation of space and the created distance and proximity between spaces of different socio-spatial quality, however, become indeed 'objectified'. In other words, they become part of the material appearance of a given space-forming structure, or a particular part of this structure. They become part of the creation of (a dynamic of) enclosed spatiality and outside orientation. Owing to such 'objectification' in built form - so the essential result of my argumentation so far - particularly the socio-spatial meaning of space formation is to be perceived.

Before the issue of how, in this vein, the socio-spatial meaning of space formation forms an integrated part of the aesthetic experience of architecture is discussed, I wish to point to the relevance of this argument concerning the question of the relative autonomy of architecture, that is, the principle relative autonomy of architecture as (a practice of) artistic design. The design and aesthetics of architectural form have been discussed in that this relativity follows from the fact that architecture represents a social and cultural practice (Frampton 1991, 2000). Furthermore, it has been stated that this relativity becomes manifest in the double identity of architecture as 'autonomous form' and as 'instrument of culture' (Hays 1984). In this context, I want to point out that the specificity of the (relative) autonomy of architecture is that it integrates formal and socio-spatial design, and that this integration is intrinsically linked to its space-forming *identity*. Moreover, this integration becomes, as explained above,

³⁵ Simmel, 1903-b, 2.

manifest and is artistically expressed in the architectural form, that is, its space-forming structure. Only if we neglect the space-forming identity of architecture and regard built structures as mere sculptures can we refer to architectural design in pure form-oriented terms. Then, however, we are actually no longer referring to architecture.

The integration of the socio-spatial meaning of space formation in the aesthetic experience of architecture

Our sensuous perception of the (built) environment is determined and influenced by various aspects that might differ from person to person. Although our visual perception seems to be - as long as we are able to see - the determining factor in the perception of the environment we reside, we also perceive this environment by the sounds we hear, by the air we smell, and by the temperature and humidity we feel. Under the concept of 'Synaesthesia' various scholars have stated and described the multifarious and composite nature of our perception as well as the mutual superimposition and complementation of the different sensations that constitute this perception (Böhme 2013, Blum 2013).³⁶ Also with regard to architecture, the multifarious nature of our perception and experience has been emphasized (Frampton [1983] 2002, Pallasmaa 2005, Haas 2013). The immediate perception of what surrounds us is further influenced by our psychological condition, our age and physical condition and is eventually superimposed by whatever use-related activity and social (inter-)action within which we are involved. However, we can regard the perception of architectural space, that is, of the space-forming structure of buildings - and of the socio-spatial meaning of space formation objectified in this structure - to be a (potential) part of this rather complex sensuous perception of the (built) environment. It represents the part, in which the socio-spatial meaning of space formation forms an integrated part of the realm of design and the aesthetic experience of architecture.

In order to demonstrate this assumed integration, we can look to the perception- and experience-oriented discourse on the fundamental relationship of man to space and its application to architecture and architectural space, as has been developed in recent phenomenological theory (Böhme 1995, 2001, 2006; Waldenfels 1996; Hahn 2008, 2017).³⁷ In particular, I wish to take up, for this purpose, Gernot Böhme's

³⁶ For an introduction into the subject of 'Synesthesia' see: Katharina Brichetti and Franz Mechsner (eds): *Synästhesie. Leib Raum / Architektur*.

³⁷ This discourse represents, in turn, a reorientation to the phenomenological examination of space as had been developed in 20th century phenomenology from a specific 'Leib'-oriented (body-oriented) perspective on human perception (Merleau-Ponty ([1945] 1966), Ströker (1965), Schmitz

concept of atmosphere. Böhme defines the term atmosphere as the central constituent in the aesthetic relationship between man (conceived as perceiving human subject) and the natural or built environment. I do not refer to Böhme's analysis of sensuous perception itself and the underlying aim of developing a fundamental theory of perception as a new theory of aesthetics.³⁸ Rather, I refer to his general use of the concept of 'atmosphere' as describing a perceptual reality. According to Böhme, this reality is constituted by its objective production and subjective experience, which, in turn, is conceived as an immediate experience based on corporeal and mental perception. In this sense, Böhme describes 'atmosphere' as uniting the objective reality of certain atmospheric qualities and our subjective (sensuous) perception. Furthermore, I refer to his identification of atmosphere with space: *'atmospheres are tempered spaces (...) that mediate between the objectively given qualities of an environment and our mental state'*.³⁹ In this sense, Böhme describes atmosphere as a perceptual space that is constituted by the mediation between certain atmospheric qualities and our subjective perception of a given space. To identify the perception of that space with the term 'atmosphere' emphasizes the fact that we actually perceive our immediate (spatial) surrounding when we perceiving space, that we perceive the atmospheric qualities that characterise this surrounding, be it the temperature of the air, or the sound or activity with which it is charged, as it were..

Concerning the creation of such atmospheric qualities of a given space, Böhme refers to architectural space formation in a rather limited way. Though he points to the material appearance of architectural form, he does not deal with its space-forming potential. Correspondingly, he does not mention the material enclosing and opening of space. Instead, he first and foremost focuses on light and sound as two essential constituents in the creation of atmospheric qualities in architectural space (2006, 107–14, 139–47). Nevertheless, his conception of atmosphere also provides, in my opinion, a fundamental insight into the sensuous perception of architectural space, understood as (the result of) an interplay of its physical enclosing and its simultaneous opening to surrounding space. Particularly the perception of the physical enclosing

(1967, 1969). For an overview of the different contributions, compare: Alexander Gosztonyi: 'Die diskriptive Phänomenologie des Raumes'. In *Der Raum*, 900–76. With regard to the various attempts of linking this phenomenological approach to space to architecture, see: Eduard Führ: 'Inside Out. Positionen der klassischen Architekturphänomenologie'. *Ausdruck und Gebrauch* 11: 32–58.

³⁸ With this 'New Aesthetics', Böhme aims at a theory of aesthetics that responds to *'the progressive aesthetisation of reality—of everyday life, of politics, of economy'*, and to the *'issue of a new relationship with nature that is enforced by the environmental problem'* (Böhme 1995, 7).

³⁹ Böhme, 2006, 16. For a detailed description and analysis of Böhme's aesthetics theory and the concept of atmosphere, see: Benno Hinkes. *Asthetik der (gebauten) Umwelt*, 129–48 and 197–226.

of space thus 'Innenräumlichkeit' (enclosed spatiality) we can qualify by describing this perception as the perception of a particular atmosphere: Namely the atmosphere of 'Umschlossenheit' (enclosedness), the atmosphere of being enclosed ourselves, be it in terms of an inside or an outside space.

At the same time, however, with regard to the sensuous perception of architecture, the concept of atmosphere only illustrates our perception of architecture in terms of a perceived surrounding, be it in various ways enclosed or open. It does not include the perception of architecture as (a configuration of) discrete objects, as objects that we perceive as being 'opposed' to us. Therefore, in order to explain how the socio-spatial meaning of space formation forms an integrated part of our aesthetic experience of architecture, I propose to widen, or rather complement Böhme's concept of atmosphere (i.e. its application to the perception of architectural space) with this second fundamental mode of perceiving architecture.

As a result, I propose to explain the sensuous perception of architectural space formation, which is the perception of the resultant space-forming structure of a given architecture, as defined by the interplay between its perception as a spatial environment (as surrounding space) and its simultaneous perception as 'opposed' object. Here, I distinguish between two basic situations and the corresponding spatial perspective from which we perceive any space-forming structure: from the inside, thus surrounded by this structure, and from the outside, thus perceiving it as an (opposed) object in space. As example, I take for both perspectives the very simple situation of the inside space of an apartment and its spatial relationship to a defined outside space. It is an inside space accessible by one door from the inside. In terms of its outside relationship, we imagine it as being situated along a public street, which is defined on either side by buildings and to which it is connected via a French window and a balcony in front. Since the objective of this example is to illustrate the interplay between perceived atmosphere and the kind of space formation, we imagine this space as completely empty and unfurnished.

Beginning with the inside perspective (and with the idea that we enter this space from the inside), the perception of the spatial situation is first characterised by the perception of a defined space with a distinct atmosphere of 'enclosedness', of being enclosed ourselves: the floor, enclosing walls, and ceiling clearly define the horizontal and vertical extensions of the space. By so doing, they also shape a particular enclosed spatiality with which the experienced atmosphere of 'enclosedness' coincides. In terms of a given socio-spatial meaning with which this atmosphere is charged, it is particularly the perception of the inside space in its horizontal extension, and of the corresponding floor space, that adds to the perceived atmosphere the impression of an inside space that can be appropriated (and used).

In relation to creating a particular atmosphere of ‘enclosedness’, however, we exclusively perceive the space-forming structure - so another essential point of my argumentation - as a continuous, space-limiting surface. In this respect, its solid, three-dimensional character disappears, as it were, behind this surface. It is by means of this perception-related reduction of the space-enclosing structure to a three-dimensional surface that an enclosed space becomes for us a defined surrounding, one that we spatially appropriate by residing in it, moving through it, and using it.⁴⁰ As a result, as long as it concerns the creation of enclosed spatiality and corresponding atmosphere of ‘enclosedness’, we do not perceive architecture (or rather the corresponding space-forming structure) as an (opposed) object. By contrast, the object-character of the space-forming structure is negated.

However, the space-enclosing shape turns into an object for us at the place where it is opened and no longer encloses. In our example, this is particularly the case where the French window gives access to a balcony in front. Here, by recognizing the soffit of the opening, the space-enclosing wall appears to us in its thickness and thus turns from a space-limiting surface into a solid element between two spaces: The inside space where we reside and the outside space of the street on the other side. Moreover, it becomes an element that generates a specific outside orientation. It is here that the space-forming structure expresses a particular socio-spatial meaning: the meaning of creating both distance between interior and exterior, and the simultaneous connection of both, creating proximity between the private dwelling and the public street in front. We particularly perceive this meaning by walking through the French window into the outside balcony and returning again to the inside. What the enclosing and separating wall also expresses or rather generates here, through its perceptible solidness, is the impression of protection.

As a particular element in the space-forming structure of a building, the balcony ‘objectifies’ (differently from both the door and window) the socio-spatial meaning of interrelation between the interior of a building and the surrounding outside space. Since the balcony is an outside extension of the interior, it creates a particular proximity between the physically separated inside and outside by occupying a limited section of the outside space. Owing to the spatial distance between balcony and the actual outside area, this occupation of the outside space allows for a superimposition of inside and outside, in our situation, between the private interior and the public

⁴⁰ Rudolf Arnheim explains this phenomenon on the basis of the inside perception of the Hagia Sophia as follows: ‘*The empty volume of space gets perceived as an extension of the human being. The concave forms of the cupolas and round walls look as if they would have received their passive guise from the fact that they have given space to the entering human being taking possession of the building*’ (Arnheim, 1977, 103–4.)

street. Here, this superimposition creates the opportunity for a socio-spatial interaction that clearly differs from that which would be enabled by the creation of a terrace on the street level.

As an integrated part of the building's façade, the balcony therefore (potentially) charges the artistic expression of the building's façade with a particular socio-spatial meaning: the meaning of a spatial interrelation between private dwelling and public street. In the design of the façade, this meaning is expressed in the direct connection of the opening with an extending platform in front. This combination creates the impression of a physical interpenetration of the vertical façade towards the outside. Owing to their difference in spatial direction, the platform detaches itself from the façade and concretely expresses the meaning of interpenetration. Based on the fact that the balcony allows for stepping out of the building, the meaning of (a possible) interaction is linked, of course, with both the imagined and real uses of the balcony.

In objectifying and expressing the moment of socio-spatial interrelation, the balcony differs from both the loggia and the oriel, or oriel window. Although it forms an outside space and represents an integrated part of the facade, the loggia remains behind the façade, which means that it does not penetrate it towards the outside. Neither does the oriel interpenetrate the façade. It instead forms an extended part of the facade by which the inside space locally penetrates the external border of the main façade. Nevertheless, it remains inside. This example illustrates the different and multi-layered ways in which the socio-spatial meaning of space formation potentially can become an artistic challenge for architectural design.⁴¹

Imagining the concrete situation of standing in the street (that is defined by buildings on either side), looking towards the French window and the balcony in front, we perceive the designed inside-out relation in the context of another enclosed spatiality: that generated by the defined street space. The corresponding atmosphere of enclosedness we perceive in the context of many other designed inside-out relations between the street and the interior of other buildings, as well as in the context of the surrounding open space. However, the perception of socio-spatial distance and proximity—both in the apartment and in the street—is intrinsically tied, so my argument, to the perception of the space-forming structure in its three-dimensional appearance. Here, it indeed complements the perception of a particular 'Innenräumlichkeit' and corresponding atmosphere of 'enclosedness'. This atmosphere, in turn, coincides

⁴¹ From the particular socio-spatial quality of the balcony results an enormous variety in terms of its practical and symbolic use. For an overview of this variety and the historical development of the balcony as a crucial element of architectural design, see: Tom Avermaete, Rem Koolhaas, and Irma Boom: *Balcony*, 2014.

with the space in which we reside and which we perceive as our (immediate) surrounding. It is limited to this space (to its specific quality of enclosed spatiality), since what we perceive as atmosphere is the sensuous (and thus mental and corporeal) relationship between us and the particular space that surrounds us.

Socio-spatial aesthetics

A fundamental reason for the integration of socio-spatial meaning into the aesthetic experience of architecture, as described above, is that both our perception and our social existence rely on spatial conditions. Another reason for this integration is the fact that as social and acting beings, we are constantly in the condition of (sensuous) perception.

As stated above, in comprising use-related and socio-spatial meaning(s), space formation enables, frames, and partially determines use-related activities and other social (inter-)actions. By so doing, it forms an integral part of practical social life. It also forms such an integrated part through the objectification of its socio-spatial meaning, as well as by influencing—in this vein—the aesthetic experience of architecture. Moreover, I maintain that the socio-spatial effect of a given space-forming structure (of one of its elements) is intrinsically tied to such influenced aesthetic experience, as relative and subjectively interpreted this experience may be. As described in the above example of the apartment with the French window, it is through its material manifestation, its artistic expression, and corresponding perception that the socio-spatial meaning of creating spatial distance and proximity also becomes effective in use-related and socio-spatial terms.

As a result, I would like to conclude this explanation by stating that at the space formation level, the use-related and socio-spatial content of architecture is integrated into its aesthetic experience. At the same time, this aesthetic experience is integrated into the use-related and socio-spatial functionality of architecture, and, hence, into the realm of use, practical life, and social reality itself. This interrelation between the realm of aesthetics and the realm of use, practical life, and social reality indeed qualifies, in my opinion, the aesthetics of space formation as socio-spatial aesthetics.

1.2 Basic Approach

As mentioned in the introduction, the main aim of this dissertation is to investigate Walter Gropius's and Aldo van Eyck's approaches to architectural design and aesthetics from the perspective of the thesis of the socio-spatial aesthetics of space formation. The main reason underlying this venture is that it offers the opportunity to analyse and discuss their theoretical positions and built architecture in terms of space formation, and to analyse and discuss the included approaches to the perception and experience of (architectural) space. In this vein, this investigation allows us to develop both a deeper insight into and a critical discussion of Gropius's and Van Eyck's approaches to architectural design and aesthetics. Here, I refer to these approaches as two essential contributions to a particular development in modern architectural history. It is the development of what has been called—in connection with the modern architecture of the beginning of the twentieth century—a 'funktionale Rückbindung' (Hartl 2006) of architecture: a 'functional backbonding'⁴² of architectural (form) design to the '*social content of architecture*' (Müller 1984, 40). This development is characterised by the fundamental position to consider the practical, use-related, and social meaning of architecture as the essential content of architectural design.

Neues Bauen and Team 10

Such an approach is linked, in particular, to the early twentieth century movement of the so-called 'Neues Bauen',⁴³ although its development within the Neues Bauen was

⁴² Being actually a concept in chemistry, the term backbonding originally means that an element (electron) consolidates its connection with another element (whole atom) by generating an additional connection. To apply this term to architecture and architectural design makes sense, since to approach architectural design from the perspective of its practical, use-related, and social meaning indeed represents a consolidation of the fundamental meaning of practical use and social reality for architectural production.

⁴³ In the present research, I refer to the term 'Neues Bauen' to describe the architectural movement of modern architecture and urban design. It developed in many European countries at the beginning of the 20th century, but as such, it has particularly been identified with the development in and protagonists from Germany, the Netherlands, Switzerland, and France. Next to some historians (Adolf Behne, Sigfried Giedion) and artists (Theo van Doesburg, El Lissitzky), the Neues Bauen mainly included architects such as Walter Gropius, Bruno Taut, and Ludwig Hilbersheimer in Germany; Le Corbusier and Andre Lurcat in France; Hannes Meyer and Hans Schmidt in Switzerland; and Gerrit Rietveld, Piet Oud, and Cornelis van Eesteren in the Netherlands. It

interrelated with the development of the artistic avant-garde movement at the end of the nineteenth and the beginning of the twentieth centuries. Furthermore, it was also based on a longer development in architectural history. Since at least the eighteenth century, architectural theorists started to directly relate architectural design—which is the design of spatial form—to the realm of material–technical construction (Laugier, Lodoli), already emphasizing its use-related purpose (Durant). From the late eighteenth century onwards, this orientation towards the use-related meaning of architectural design continued in close connection with an intensive examination of the constructional and material–technical side of architecture.⁴⁴

However, within the Neues Bauen, (daily) use and practical life took centre stage as the essential content of design. At the aesthetic level, such use-oriented approach to architectural design was characterised by the refusal of any (aesthetic) autonomy of architectural form. Instead, artistic design and aesthetics should be neutralised as an end in itself. In the context of the Weißenhof exhibition in 1927, Ludwig Hilbersheimer characterised this approach by arguing that *‘the aesthetic element is ... no longer superordinated, an end in itself ... but it is, as all other elements, integrated into the whole’*.⁴⁵ The belief to neutralise, in this vein, the traditional concept of architectural design and aesthetics, and its disposedness to ornamental design, is symbolically expressed by explicitly using the term ‘Bauen’ (building) and not architecture. As Ludwig Mies van der Rohe put it 1923: *‘It is our specific concern to liberate building activity from aesthetic speculators and make building what alone it should be. Namely BUILDING’*.⁴⁶ Second, as a part of this intended neutralisation of architectural design and aesthetics as an end in itself, the artistic identity of architectural design got directly connected with its use-related function. Particularly by regarding the practical use of a building as the very design-determining content, architecture was believed to reach an inner or organic unity—a *‘new nativeness’* as Adolf Behne put it (Behne, 1926, 41). In this respect, Hugo Häring believed to have found in the *organic* form the appropriate artistic moment, whereby the design of architectural form—conceived as originally being geometric

eventually resulted in the foundation of CIAM in 1928. In the shape of the CIAM, it continues to be developed with a focus on urban planning since the 1930s.

⁴⁴ In this dissertation, I do not go into this architecture–theoretical development and particularly leave aside the explanation of the relationship between the Neues Bauen and preceding approaches in nineteenth and early 20th centuries, including the Werkbund and the artistic avant-garde. Also, I leave aside any culture–theoretical qualification of the Neues Bauen in relation to the nineteenth-century theory.

⁴⁵ Hilbersheimer, 1927, 5. As this quote indicates, at least among the architects and planners of the Neues Bauen, the understanding of ‘aesthetics’ was that of comprising the various aspects of the design of architectural form.

⁴⁶ Mies van der Rohe, 1923.

in nature—becomes an integral part of the practical use of architecture—and with this, of human life (Häring [1925] 1965, 13–14, [1931] 1965, 24–25).

Third, the approach of the Neues Bauen was characterised by the social and socio-economic contextualisation of this use-oriented ‘backbonding’ of architectural design and aesthetics. This was most clearly expressed in Sigfried Giedion’s (Giedion, 1929) and Ernst May’s (May, 1929) concept of, and postulation for, the ‘Wohnung für das Existenzminimum’ (dwelling for the minimum of existence), in which design, use, and economic reasoning were intimately connected. This socio-economic contextualisation of architecture also implied a fundamental reference to the condition of the Industrial Age—whether with the attempt to either overcome the capitalistic condition of an industrial mode of production or not. Eventually, construction and fabrication were also principally linked to this contextualisation of use, as the kind of material–technical production was regarded as an essential means of realising this socio-economically determined content of architectural design. Accordingly, this contextualisation of architectural design also implied efficiency in planning and production, and, with this, the standardization of both constructions as well as use.⁴⁷

As it regards the fundamental position to consider the practical, use-related, and social meaning of architecture as the essential content of architectural design, my second point of reference is Team 10, which came into existence in the early 1950s⁴⁸ and continued the examination of architectural design from this position. Here, Team 10 also aimed to bring architectural design in consonance with the social and socio-economic reality of human life.⁴⁹ It differed, however, from the Neues Bauen by its socio-anthropological perspective on use and use-related activity and correspondingly on architecture and urban design/planning. This perspective was part, or, rather, the result, of a general anthropological orientation in philosophy and social

⁴⁷ With this kind of socio-economic contextualisation of architectural design, the Neues Bauen distinguished itself, in comparison with the German Werkbund, in bringing the issue of how to bring architectural design in consonance with the present and its industrial mode of production and corresponding standardization at a *socio-spatial* level. Furthermore, based on the belief of the decisive significance of industrialization for the social emancipation of the population, the standardization of building production acquired for the *Neues Bauen* via spatial design and planning assumes an almost ethical meaning.

⁴⁸ Van den Heuvel and Risselada refer to the year 1953 as the starting point of the history of Team 10 as it marks the beginning of the ‘*most intensive interaction between the core participants*’ (2005, 11.)

⁴⁹ Different from the term ‘Neues Bauen’, which rather defines a stage in the development of modern architecture, the term ‘Team 10’ clearly defines a particular group of architects and planners. Concerning this group, I refer to the first period of its existence, particularly comprising the founding and core members Alison and Peter Smithson, Jaap Bakema, Georges Candilis and Shadrach Woods, and Giancarlo De Carlo and Aldo Van Eyck.

science, characterising the immediate post-war time in Western Europe. The specificity of Team 10 was to bring this anthropological orientation into the realm of architecture and urban design.⁵⁰ Here, the various members of Team 10 were driven by the aim to develop an ‘alternative rationality’ (Avermaete, 2005) in design and planning—an alternative to the rather abstract-analytical approach of CIAM as it had been developed since the early years of its existence.⁵¹ It was a different rationality that took daily life and its determining social and cultural conditions as the constituting factors of both the built environment and planning—this means an approach towards architectural (form) design and planning from the individual and the collective socio-spatial perspective of people and their cultural identity. As a result, the notion of the social was no longer predominately socio-economic, but rather socio-cultural. Moreover, it was no longer predominately conceived in organizational and administrative terms, but rather in individual and community-related terms.⁵² It was interpreted in terms of identity and of belonging (meaning: the identification of the individual human being with his/her socio-cultural and -spatial situation of living), and identified with the social (and socio-psychological) appropriation of space as one’s private or collectively shared place of living. In terms of this difference, however, the anthropological perspective of Team 10, and the corresponding alternative view on design and planning still represented a continuous development of the approach of Neues Bauen to regard the ‘social content of architecture’ as its very artistic content. Here the idea of what a social content implies was not replaced but rather completed by a socio-psychological and socio-cultural orientation to use, practical life, and social reality.

⁵⁰ According to Tom Avermaete, it was, in particular, the combination of ‘cultural’ and ‘spatial’ perspectives that was a characteristic of postwar Anglo-Saxon and French anthropology, and it seems to have caught the attention of architects (Avermaete, 2010, 124–125).

⁵¹ For a detailed discussion of this discourse, see: Eric Mumford. *The CIAM Discourse on Urbanism 1928–1960*, (2000), and Tom Avermaete. ‘Reframing the Rational’ and ‘Epistemologists of the Every Day’, in: Avermaete, 2005, pp. 57–107.

⁵² This change in orientation did not mean that the interest in the socio-economic realm of production and organization was lost. The ‘alternative rationality’ still principally included the acknowledgement of the level of socio-economic production and particularly the postwar condition with its enormous need for housing.

Gropius and Van Eyck

Within the movement of Neues Bauen, the orientation to use, practical life, and social reality was accompanied by a focus on spatial design. This orientation included an implicit reference to space formation, particularly in terms of the use-related arrangement and relating of spaces, as well as their opening to outside space. It was a reference that acknowledged the self-evident significance of the moment of enclosing, of opening and of the spatial arrangement or configuration of spaces as essential means of design. At the same time, this kind of reference did not imply an interest in a deeper understanding of space formation itself. This mere implicit reference to space formation continued in Team 10, though with a socio-psychological and socio-cultural orientation to use.⁵³ What distinguishes, in this respect, Gropius and Van Eyck from other protagonists of the Neues Bauen and Team 10 is that they developed within their movement, or group, the approach that most elaborately involves the realm of aesthetics: Although they (also) refer to architectural aesthetics in an object-oriented and rather formal way, they refer to the realm of subjective perception, particularly in relation to (architectural) space. It is this reference to the realm of subjective perception of space that distinguishes them from other protagonists of the Neues Bauen and Team 10, and which is the main reason why I have chosen their approaches to analyse and discuss from the perspective of my thesis.

In focusing on Gropius's and Van Eyck's approaches to architectural design and aesthetics, my intention is, on the one hand, to throw light on this particular quality of Gropius's and Van Eyck's theoretical approach. On the other hand, it is the intention to critically examine and re-evaluate their theoretical as practical references to space formation, as well as their concepts of architectural aesthetics, and which includes their approaches to the perception of space.

1.3 Research Question, Methodological Approach and Relevance

On the basis of the basic approach of this dissertation, as explained, and the above-mentioned focus of the analysis, the following research questions have been identified:

⁵³ Here, an exception is Jaap Bakema, who explicitly used the term space formation, for instance, in his inaugural speech as a professor of architectural design at the TU Delft in 1964.

- a) How did Gropius and Van Eyck refer to space formation? How did they use space formation as a means of design?
- b) How did they refer to the human perception of (architectural) space?
- c) Did they link the perception of (architectural) space with space formation (the aspects referred to by them), and if so, how did they do so?
- d) Did they link the purposiveness and aesthetics of architectural design in different ways; and with what particular concept of architectural aesthetics did they do so?

With these four questions, three research subjects and their mutual relationship are defined:

- a) The reference to space formation,
- b) The approach to the perception of (architectural) space,
- c) The concept of architectural aesthetics.

Analysing Gropius's and Van Eyck's approaches in this way implies the possibility of situating both in a broader context of architectural theory: the examination of space formation as an (essential) element of architectural design and aesthetics as it took place within the late nineteenth and early twentieth centuries architectural discourse. Also, for this reason, my research was initiated by investigating the notion(s) of space formation within that discourse. The selected theories and concepts were chosen according to the question, in how far they can also be regarded as part of the described development of a 'functional backbonding' of architectural design. This kind of contextualisation of Gropius's and Van Eyck's concepts was motivated by the resultant possibility to draw new conclusions regarding the understanding of architectural space and space formation, and its development, in the first half of the twentieth century.

Next to situating Gropius and Van Eyck in this specific theoretical context, I analysed their positions, that is, their approaches to (the perception of) space in the context of the Neues Bauen (Gropius) and Team 10 (Van Eyck). This includes, in the case of Gropius, the analysis of László Moholy-Nagy's and Theo Van Doesburg's concepts of space, and, in the case of Van Eyck, to refer to Alison and Peter Smithson and Jaap Bakema.

The main focus of my research, however, was on Gropius's and Van Eyck's (implicit) references to space formation, on their approaches to architectural space and its perception, as well as their concepts of architectural aesthetics. Concerning both architects, this research illustrated that their reference to architectural space formation was embedded into, and strongly determined by, their overall approach to

architectural design. This in turn expressed how for Gropius and Van Eyck architectural design was related to, and to be integrated with, the realm of use and practical life as well as social reality. Therefore, the analysis of their references to space formation became complemented by the attempt to define the essential constituents of their overall approach to architectural design.

Also in both cases, the ideas on architectural space formation and the perception of architectural space naturally turned out to be directly related to their general approaches to, or rather concepts of space. In the case of Van Eyck, his concept of space even turned out to represent the main part of his general approach to architecture. Therefore, the analysis of their approaches to the perception of (architectural) space changed to the examination of the underlying concepts of space itself, both characterised by a perspective that focuses on the subjective relation of man to space.

Next to their (implicit) references to space formation and their approaches to the perception of (architectural) space, the third research subject has been their concept of architectural aesthetics and the question, whether and how the three subjects were related to one another. In this vein, my examination of Gropius's and Van Eyck's views on architectural design and aesthetics developed to a stepwise approach to the present relationship between space formation, space and its human perception, and their concept of architectural aesthetics.

Finally, my examination of Gropius's and Van Eyck's approaches to architectural design and aesthetics included the analysis of their work as practising architects, that is their effective use of space formation as a means of design. The selection of case studies was determined by my intention to more or less cover the whole time span of Gropius's and Van Eyck's lives as practising architects, to exemplify their theoretical positions, and to compare theory and practice. The kind of building analysis that I applied was determined by the aim to analyse the particular type of space formation. Therefore, in all case studies the analysis of the space-forming structure (as defined in my thesis) forms the central object of analysis. It is more detailed explained in the Chapters 4 and 6.

Relevance in relation to existing research

The basic and methodological approach of this dissertation fundamentally differs from a historiographical approach. It is less oriented towards a historical classification than a conceptual evaluation. Although I situate Gropius's and Van Eyck's views and concepts in a particular historical development (a development that is to be un-

derstood only in the context of a particular historical situation and associated paradigms), the primary reference to their views is conceptual in nature. At the same time, my aim has been to compare their views with other contemporary approaches and positions. Such comparative analysis and discussion has allowed me to focus on a set of specific subjects, and ultimately, on space formation as a fundamental constituent of architectural design. With this specific approach, this dissertation aims to make a contribution to an improved understanding of the design theory and practice of Gropius and Van Eyck, as well as to make a contribution to our understanding of the examination of space formation within the 'kunstwissenschaftlichen' discourse on architectural design and aesthetics, in particular, of Schmarsow's aesthetic theory on architecture.

In relation to the existing research on Gropius⁵⁴ and Van Eyck,⁵⁵ I want to open up a different analytical perspective. In my opinion, this perspective enables us to not only bring together the various constituent parts of their conceptions but also allows a more precise definition and critical evaluation. This, in turn, allows one to disclose particular contradictions of their approaches to architectural design and aesthetics. To this day, such an analytical perspective does not exist, since research has been largely limited to the explanation of the various constituent parts of Gropius's and Van Eyck's ideas and approaches.

In relation to the existing research that has been done on the various protagonists within the 'kunstwissenschaftliche' examination on architectural space and space formation,⁵⁶ the approach of this dissertation also opens up a new perspective, since space formation itself takes centre stage in a comprehensive way, combining its aesthetic as well as its use-related and socio-spatial meaning. In particular, this perspective allows us to qualify the theories of August Schmarsow, Paul Frankl, and Leo Adler, apart, in relation to one another, and to other contributions.

⁵⁴ Pevsner (1936), Herbert (1959), Argan (1962), Franciscano (1971), Wilhelm (1983), Nerdinger (1985), Claussen (1986), Probst, Schädlich (1987), Müller (2004), Poerschke (2005), Sommer (2010).

⁵⁵ Hertzberger, Strauven et al. (1982), Engel (1990), Strauven ([1994], 1998), Lefaivre, Tzonis (1999), Ligtelijn, Strauven (2010), Avermaete (2010, 2011), Lammers (2012), Teyssot (2013), McCarter (2015).

⁵⁶ Ullmann (1967), Van de Ven (1987), Schwarzer (1991), Ikonomidou and Mallgrave (1994), Meyer (1998), Kieren (2000), Moravanszky (2003), Zug (2006), Hartl (2006), Friedrich and Gleiter (2007), Schützeichel (2013, 2015).

‘As the creatress of space, architecture creates, in a way no other art can, enclosures for us in which the vertical middle axis is not physically present but remains empty. It operates and is defined as the place of the subject ... The spatial construct is, so to speak, an emanation of the human being present, a projection from within the subject, irrespective of whether we physically place ourselves inside the space or mentally project ourselves into it’.

August Schmarsow, 1893

‘The four walls are the necessary boundary between our particular space and that general space out there, just they make the fenced-in spot of ground to our property, within which we centre ourselves from dissipation, being content with ourselves even by dispense with the wide world’.

August Schmarsow, 1905

‘The moulded space is the theatre for certain human activities, and these are the focus of our perception. Once we have reinterpreted the optical image into a conception of space enclosed by mass, we read its purpose from the spatial form. We thus grasp its spiritual import, its content, its meaning’.

Paul Frankl, 1914

‘As the desire for space is the ‘living soul’ of the architectural creation, thus an ideal factor (...) the need for space is also of space-forming creativity, and to this materialistic factor, to stay in the picture, should be attached the just as vibrant physical shape of a building’.

Leo Adler, 1926

2 THE APPROACH OF AUGUST SCHMARSOW AND TWO OTHER APPROACHES TO ARCHITECTURAL SPACE FORMATION

In the course of my research on the art–scientific architectural discourse at the beginning of the twentieth century, August Schmarsow’s, Paul Frankl’s, and Leo Adler’s conceptions of, or references to, space formation turned out to be the most relevant concerning the aim of identifying considerations that confirm my approach to space formation. Here the relevance of Frankl’s and Adler’s conceptions is based on the - to this day neglected ⁵⁷ - fact that both not only include the identification of a purposive, use-related meaning (function) of space formation, or of a particular aspect of space formation to which they refer, respectively. Instead, they additionally relate this purposive meaning to the realm of aesthetics and refer to aesthetics in terms of form-related design and its perception. Schmarsow also deals with space formation not only at an aesthetic- and perception-oriented level, but likewise acknowledges a use-related meaning of space formation. Nevertheless, his theory is mainly relevant for this research as it provides fundamental insights into the aesthetic relation between man and (architectural) space and the corresponding meaning of space formation. ⁵⁸

⁵⁷ In the existing research on the art–scientific architectural discourse (see footnote 48), an examination of the question, whether the purposive and aesthetic meaning of space formation was linked to each other, and thus the double identity of space formation was broached as an issue, does not exist.

⁵⁸ By contrast, the concepts of space formation that are to be found in the writings of Erwin Gutkind (1915), Otto Karow (1921), Erich A. Brinkmann (1922), Dagobert Frey (1924), Paul Klopfer (1926), Fritz Schumacher (1926) and Karin Heufelder (1928), all essential contributions to

In this Chapter, each reference to space formation is explained as part of an overall architecture–theoretical conception. Here I want to get to know how (the particular aspect of) space formation is discussed in use-related or socio-spatial terms. Furthermore, I want to ascertain whether and how such purposive meaning of space formation is related to the realm of aesthetics. By so doing, the idea is to qualify the three approaches from the perspective of my thesis of the socio-spatial aesthetics of space formation and to clarify to what extent a connection between the use-related and socio-spatial purposiveness of architectural design, on the one hand, and aesthetics, on the other, is to be discerned. Though before Schmarsow's, Frankl's and Adler's theories and conceptions take centre stage, I first give attention to the references to space formation as they are to be found in the European architectural theory, starting with Leon Battista Alberti. This I do, in order to illustrate which significance space formation was addressed before its discussion at the beginning of the twentieth century.

2.1 Space Formation in Architectural Theory until the Beginning of the Twentieth Century

As several scholars have pointed out (Colquhoun 1989; Frampton 1995; Forty 2000; Moravánszky 2003), 'space' did not exist as an architecture–theoretical concept before its introduction by German-language theoreticians—first and foremost, by August Schmarsow—in the field of architectural aesthetics at the end of the nineteenth century. As Alan Colquhoun remarks, *'In one sense all Schmarsow did was to categorise something that had always existed'*.⁵⁹ Indeed, from the first moment of its existence, the separation of a materially defined space from general space has been the very basis of architecture. Accordingly, also in architectural theory the immediate creation of

the art-scientific architectural discourse, did not refer to the use-related purposiveness of space formation. Therefore, none of them is discussed here. Eventually, I also left aside Paul Zucker's (1922, 1924) contribution to this discourse. Even though he just aimed at synthesizing Schmarsow's and Frankl's approach. But from the perspective of this research, he did not deal enough with space formation. To a different extent, the same goes for Hermann Sörgel, whose theory I neither discuss in this Chapter. However, I refer to his architectural theory in the following Chapter, since Sörgel's approach to the human perception of space formed an essential source of inspiration for Walter Gropius and his corresponding approach.

⁵⁹ Colquhoun, [1985] 1989, 225.

materially defined spaces must always have been recognised as an element of architectural design. The same goes for the arrangement of these spaces, whether by having reflecting on the underlying practical, use-related motif or in the context of composition.

Therefore, space formation was a subject of architectural theory also in the Renaissance period, and it was so in a use-related sense. This, at least, we may conclude from Leon Battista Alberti's *De re aedificatoria* (On the Art of Building), where he discusses the right arrangement of rooms according to their specific use and in relation to the surrounding general space, and the sun.⁶⁰ The same applies to Andrea Palladio and his *Quattro libri dell'Architettura* (The Four Books on Architecture).⁶¹ And different to our general conception of the architectural theory of the seventeenth and eighteenth centuries, also at that time space formation was a subject of the architecture-theoretical consideration. This we may conclude from Antoine Laugier's *Essai sur l'architecture* (An Essay on architecture). Similar to Alberti and Palladio, though in a more comprehensive and detailed way, also Laugier referred to space formation in use-related terms. In the paragraph: *De la commodité des bâtimens* (On the Convenience of Buildings), he discusses the right arrangement of a courtyard space and entrances, of inside spaces and stairways according to their specific use—both in relation to one another as well as to the surrounding general space and the sun. Furthermore, in his reference to the Gothic cathedral, particularly to Notre Dame in Paris, he deals with architectural space in aesthetic terms, that is, in terms of its sensuous perception. Here he points out the impression one has when entering the church and being struck 'by the size, the height and the unobstructed view on the vast nave; for some moments I am lost in the amazement that the grand effect of the whole stirs on me'.⁶² Giving this attention to architectural space in clear aesthetic terms, Laugier aimed at enhancing contemporary church architecture by transforming the 'grace and majesty' of the Gothic cathedral into the order of the classical architecture tradition.

Alberti's, Palladio's, and Laugier's use-related reference to space formation found its continuation in the nineteenth century. We find it in different ways, for instance, in Jean-Nicolas-Louis Durand's approach towards architectural design and in Karl Friedrich Schinkel. In line with his general focus on the moment of purposiveness, Durand also referred to space formation, to the sizing and the figuration of a room,

⁶⁰ Alberti, [1443–52] 1965, 21, 48–49.

⁶¹ Palladio, [1570] 1984, 84, 114. As Caroline Constant (1988, 9–18) points out, Palladio had a clear scenographic concept of space. Moreover, the way in which his buildings are open to the outside illustrates that he must have regarded space formation as a fundamental *artistic* element of architectural design.

⁶² Laugier, 1753. (Quoted from the edited English translation 1977, 101)

and to the kind of opening and arrangement of different rooms as a matter of use- and design-related purposiveness.⁶³ Schinkel's (implicit) reference to space formation included, in turn, a more comprehensive examination of the use itself, as well as an explicit reference to the spatial relation of a building's inside with its surroundings.⁶⁴ Furthermore, he is a good example to describe the self-evident way how nineteenth century architects, with their focus on material construction, referred in their designs to various shapes and structures of spatial enclosure without reflecting and discussing the aspects of enclosing, opening, or the spatial arrangement of spaces. In contrast, it was the mode of construction that took centre stage, for instance, a specific kind of a vault construction by which a particular space was covered.

Next to such indirect construction-oriented reference to the enclosing of space, in the nineteenth century the subject of enclosing and thus space formation also appeared in architecture-theoretical writings in a *direct* sense. Most prominently it did so in Georg Wilhelm Friedrich Hegel's lectures on aesthetics between 1817 and 1829.⁶⁵ In these lectures, Hegel discusses the enclosing of space in use-related terms, although the kind of use he refers to is of an ideal nature: With regard to the Gothic cathedral, he emphasises the significance of material separation and the resultant discreteness of a church's inside from the surrounding space for the purpose of worship and religious contemplation. At the same time, however, he links architectural aesthetics—understood as the realm of symbolic expression and sensual impression—with the way how it acts in relation to such 'purposive' enclosing and its ideal use-related function. I quote Hegel at length here in order to give an idea of how already he related architectural aesthetics and (socio-spatial) use, focusing on space formation as a pivotal element in this relation:

Just as the Christian spirit concentrates itself in the inner life, so the building becomes the place shut in at every side for the assembly of the Christian congregation and the collection of its thoughts. The spatial enclosure corresponds to the concentration of mind within, and results from it. But the worship of the Christian heart is at the same time an elevation above the finite so that this elevation now determines the character of the house of God. In this way architecture acquires elevation to the infinite as the significance which it is driven to express in architectonic forms, a significance independent of mere purposiveness. The impression, therefore, which art now has to produce is, on the one hand, (...), the impression of this tranquility of the heart which, released from the external world of nature and from the mundane in general, is shut in

⁶³ Durand, [1802–1805] 1831, 122–127.

⁶⁴ Here I refer to Goerd Peschken's publication: *Karl Friedrich Schinkel. Das Architektonische Lehrbuch* (2001), in which all text-fragments and illustrations of the never completed and published work of Schinkel are collected, explained, and classified.

⁶⁵ Hegel's lectures on aesthetics were just posthumously published between 1835 and 1838.

upon itself, and, on the other hand, the impression of a majestic sublimity which aspires beyond and outsoars mathematical limitation. (...)

Enclosure was to give effect to this forgetting of the external world of nature and the distracting activities and interests of finite existence. Adieu therefore to open entrance halls and colonnades, etc.; in their openness they are connected with the world and so they are now given instead in a totally different way a position inside the building. For the same reason the light of the sun is excluded or it only glimmers dimly through windows of the stained glass necessary for complete separation from the world outside. What people need here is not provided by the world of nature; on the contrary they need a world made by and for man alone, for this worship and the preoccupations of his inner life.⁶⁶

Following Hegel's additional distinction between enclosing and bearing, which he stated with regard to the temple architecture in Ancient Greece ([1842] 1984, 52), it was Karl Bötticher (1852: Exkurs 1, p.7) who explicitly defined space formation, in terms of a (vertical) enclosing of space, as to be diametrically opposed to the (form) aesthetics of construction, particularly defined by him as the genuine artistic content of architecture. Gottfried Semper ([1860–63] 1977) again referred to the enclosing of space in an explicit way and again only in a use-related sense. However, his approach stands out within the context of the nineteenth century architectural theory, as he pointed to the socio-spatial meaning of enclosing to create a protected and private realm of living by means of its separation from a general space. Furthermore, he linked this socio-spatial reference to spatial enclosing with the realm of handicraft and fabrication, since, for Semper, the forming of enclosed space appeared in pre-historic times with the woven separation of the home from the outer life: '*... for it is certain that the use of crude weaving (...) preceded the simple wall made from stone or any other material as a means of dividing the 'home', the inner life from the outer life and as a formal construct of the spatial idea.*'⁶⁷ Moreover, Semper additionally linked the enclosing of space with form- and construction-related aesthetics, even if only in an indirect fashion. He did so, by additionally referring—in his theory of 'Bekleidungsprinzip' (dressing principle)—to the space-enclosing wall as the *dressing* skin of a building. By so doing, the space-enclosing wall turns into the medium, on the basis of which the artistic sublimation of whatever material construction, be it tectonic or stereotomic of nature, gets realised and symbolically expressed.

But despite such indirect linking of space formation with the design of architectural form, it was not before the last third of the nineteenth century that the enclosed space itself took centre stage and that it did so in aesthetic terms. In this respect,

⁶⁶ Hegel, 1984. Quoted from the English translation 1975, 68–86.

⁶⁷ Semper, [1860–63] 1977, 228.

Richard Lucaes's article *Über die Macht des Raumes in der Baukunst* (On the power of space in architecture) in 1869 and Hans Auer's article: *Die Entwicklung des Raumes in der Baukunst* (The development of space in architecture) in 1883 are generally regarded as the first relevant publications. Yet, it was indeed August Schmarsow (Schmarsow 1893, 1896, 1905) who several years later developed a first fundamental aesthetic theory on architectural space and its formation and 'proclaimed' the enclosing of space to be the very (aesthetic) essence of architectural design.

2.2 Relating Aesthetics and Purposiveness: Three Particular Approaches to Architectural Space Formation within the 'Art-scientific' Discourse on Architecture

Following Schmarsow's definition of architecture as *Raumgestalterin* (the 'creatress' of space), architectural space and its formation developed 20 years later to an essential and generally accepted category in the aesthetic examination of architecture, both among German-speaking art historians as well as architects.⁶⁸ Next to various book publications in which the subject of architectural space, including its formation, took a prominent position (Gutkind 1915, Karow 1921, Sörgel 1921, Brinkmann 1922, Adler 1926, Schumacher 1926), a corresponding discourse unfolded in the *Zeitschrift für Ästhetik und allgemeine Kunstwissenschaft*, founded in 1906, and other journals (Schmarsow 1914, 1919, 1921, 1922; Schumacher 1919; Zucker 1922, 1924; Frey 1924, Klopfer 1926). In addition to this rather conceptual examination of architectural space and space formation, both acquired a central significance among practicing architects. Here we find a first explicit orientation towards architectural space, also at the turn of the twentieth century, in Vienna, namely in Adolf Loos (1898, 1927), Rudolf M. Schindler (1912), and Oskar Strnad (1913).⁶⁹ Within the different

⁶⁸ Within this primarily aesthetic discourse, the term 'Raumbildung' (space formation) and 'Raumgestaltung' (spatial or interior design) were used synonymically. Schmarsow, for instance, almost exclusively used the term 'Raumgestaltung' by actually referring to 'Raumbildung', that is to the immediate creation of defined inside spaces by means of a physical enclosure. Owing to the focus on the formation and design of enclosed spaces, a differentiation between formation and design, as well as a corresponding qualification of both in relation to one another, did not take place.

⁶⁹ We also find a corresponding orientation in Hendrik Petrus Berlage's (1905) understanding of architectural design. For a detailed discussion of this development among Viennese architects, see: Cristopher Long. *The New Space. Movement and Experience in Viennese Modern Architecture*, (2016).

ways how space took centre stage—be it in general design-related or in explicit aesthetic or rather purposive terms—it was Loos, whose reference to architectural space still included, in reference to Semper, the explicit mentioning of the purposive function of spatial enclosing to create a private realm: ‘*The architect’s task is to provide a warm and livable space. Carpets are warm and livable. He decides for this reason to spread out one carpet on the floor and to hang up four to form the four walls*’.⁷⁰ Yet, this well-known statement implies an aesthetic reference to spatial enclosing, to create a specific spatial atmosphere, and by so doing, to create a specific sensuous experience.

As a result, not later than in the 1920s, at least within the German-language area, space formation was generally recognised as an essential feature of architectural design, both in purposive and aesthetic terms. Within this context, it was Paul Frankl and Leo Adler who directly referred to the purposive use-related function of architectural space formation—be it by referring either to the aspect of composition or that of enclosing—and who simultaneously connected the use-related function with the realm of aesthetics. Therefore, and as already motivated, next to Schmarsow’s theory, Frankl’s and Adler’s approaches are of particular interest for a discussion of space formation from the perspective of the socio-spatial aesthetics of space formation.

Schmarsow’s twofold approach to space formation

August Schmarsow’s theory of architecture as ‘Raumgestalterin’ was part of a fundamental change in the late nineteenth century concerning the understanding of aesthetics. Different to the prevailing notion of aesthetics as comprising a theory of beauty, of arts, and of sensual knowledge,⁷¹ the so-called ‘Einfühlungstheorie’ (theory of empathy) or ‘Einfühlungsästhetik’ (aesthetics of empathy), as it was mainly developed by Friedrich Theodor and Robert Vischer (1866, 1873) and Theodor Lipps (1891, 1906), started to identify aesthetics with the process of individual sensuous perception. Here the ‘Einfühlungsvermögen’ (ability of empathy)—that is, the basic human ability of a mental deepening in and an emotional response towards what gets perceived—was regarded as the decisive element of this process. At the

⁷⁰ Loos, [1898] 1962, quoted from the English translation in Risselada, 2008, 170.

⁷¹ Established by Alexander Baumgarten in the middle of the eighteenth century. For a detailed explanation of this development, and the various positions and their development, see: Mallgrave and Ikonomidou. *Empathy, Form and Space. Problems in German Aesthetics 1875–1895*, (1994), and Friedrich and Gleiter. *Einführung und phänomenologische Reduktion. Grundlagentexte zu Architektur, Design und Kunst*, (2007).

same time, the psychological moment of empathy was complemented by explaining its existence in immediate relation to physiological processes, in particular in relation to the sensorimotor processes of (mainly) visual perception.⁷² By doing so, the approach of a perception-based aesthetics of empathy was believed to be (nature-)scientifically substantiated. Next to being intrinsically bound to such conception of aesthetics, Schmarsow's approach was art-historical in nature and part of a particular development in art history. This development was characterised by the demand to complement a pure historical descriptive approach (and the corresponding systemisation of the development of arts in periods and areas of style) by the ambition to systematically define the universal characteristics of different visual arts and therefore to objectify both the knowledge of these arts and the knowledge of their evolution throughout history.

Being based on the discourse on empathy, as well as being part of that art-scientific approach in art history, the specificity of Schmarsow's theory, on which I focus here,⁷³ resides in the fact that he linked the aesthetics of visual arts in general and of architecture in particular with the sensuous perception of space. Moreover, he referred to visual and tactile perception as well as to real or imagined movement through space, and also linked sensuous perception to the fundamental three-dimensional constitution of the human body. In this regard, and as it has already been pointed out (Schwarzer 1991, Mallgrave and Ikonomou 1994), Schmarsow relied on the work of Robert Vischer, Hermann Lotze, Wilhelm Wundt, and Carl Stumpf.⁷⁴ With the latter he had in common, first, the reference to the perception of space as a synthesis of visual and tactile perception; second, the emphasis on the perception of space in terms of spatial depth; and third, the inclusion of the level of imagination. What distinguished him from Stumpf, however, was the urge to link the (imagined) perception of depth with bodily movement through space.

The second specificity of Schmarsow's theory is that on the basis of this comprehensive reference to perception and by using the example of architecture, he aimed to generally oppose an '*aesthetics from without*,' which he described as the prevalent

⁷² Relying on the physiological research on perception of Hermann Lotze and Wilhelm Wundt. (Lotze. *Allgemeine Physiologie des körperlichen Lebens*, (1851), *Medizinische Psychologie oder Physiologie der Seele*, (1852). Wundt, *Grundzüge der physiologischen Psychologie*, (1874))

⁷³ A detailed discussion, and qualification, of Schmarsow in relation to the development of the theory of empathy is not indented here, and seems to me neither necessary nor possible within the theoretical frame of this Chapter. For a general contextualisation of Schmarsow's approach see: Mitchell Schwarzer: *The Emergence of Architectural Space: August Schmarsow's theory of Raumgestaltung*, (1991), and: Harry Francis Mallgrave and Eleftherios Ikonomou. *Empathy, Form and Space. Problems in German Aesthetics 1873–1893*, (1994).

⁷⁴ Carl Stumpf. *Über den psychologischen Ursprung der Raumvorstellung*, (1873).

focus within art history on the material appearance of buildings—an ‘*aesthetics from within*’.⁷⁵ Here he did not mean to focus on the building’s inside space instead of its outside shape and appearance. The ‘within’ to which he pointed was the psychological–physiological perception of space, since for him, this perception was intrinsically linked to the fundamental spatial constitution of man, according to Schmarsow the ‘inner’ origin and determining factor of both the experience of built space and its formation. For him,

*from the natural condition as organic creature that finds itself existent as a physical body in general space, accrue the manifold relations of the spatial being and living of man. The examination within the spatial construct certainly begins, in a literal sense, out of the own body.*⁷⁶

Accordingly, he applied this approach not only to architecture, but also to sculpture and painting, aiming at defining the artistic nature of all visual arts on the basis of their fundamental difference in terms of spatial orientation and their intrinsic relation with the corresponding three principles of design: symmetry, proportionality, and rhythm.⁷⁷

As a result, the crucial difference between Schmarsow and other theorists of empathy was to transcend the realm of perception and to include, as a matter of principle, the realm of creation in the aesthetic theory on architecture. Moreover, he claimed to have explained the enclosing of space out of the fundamental spatial constitution of man, thereby explaining the creative practice ‘genetisch’ (in a genetic way), as he called it, thus in a (nature-)scientific way.²¹

The central element in Schmarsow’s theory of the human perception of space, or rather three dimensionality, and based on the spatial constitution of the human body, is the so-called subjective ‘*Anschauungsraum*’ (space of intuition).⁷⁸ He conceives it as being build up out of the three already mentioned modes of perception or senses: a) visual perception or the sense of sight, b) corporeal perception or the sense of touch and c) bodily motion in space. As such a three-part complex of perception, the ‘space of intuition’ is determined by, and the expression of, the principle three-dimensional constitution of the human body. As a result of the upright walk and therefore as a quasi-spatial expression of the human self, the vertical axis from

⁷⁵ Schmarsow, 1893, 3.

⁷⁶ Schmarsow 1896, 2.

⁷⁷ See: August Schmarsow. *Grundbegriffe Der Kunstwissenschaft*, 1905, 55–99.

²¹ According to Beatrix Zug-Rosenblatt, Schmarsow relied here on Wilhelm Dilthey’s concepts of aesthetics and his fundamental claim that ‘*the aesthetician has to start from the creative processes in the various disciplines of art*’. (Zug, 2006, 12, quoting Dilthey: ‘Die drei Epochen der modernen Ästhetik und ihre heutige Aufgabe (1892)’. In *Gesammelte Schriften*, (1968).

⁷⁸ Here I follow Mallgrave’s and Ikonomou’s English translation of the term ‘*Anschauungsraum*’.

head to toe is for Schmarsow the starting point of any perception (intuition) of space. In the vertical axis, the two horizontal dimensions of space and its perception meets: the width (right–left orientation) and the depth (front–back orientation). As with regard to the vertical dimension, Schmarsow links the two horizontal dimensions with the physical condition of the human body, that is, with the spatial-physical structure of the human skeleton and the arrangement of the sensory organs. He particularly connects the dimension of width with the location and movement of eyes as well as with the arrangement of shoulders, arms, and pelvis. He particularly links the dimension of depth with the spatial orientation of the eyes as well as with the movement of the legs, knees, and feet in the forward direction.

Furthermore, Schmarsow refers to the three different modes of perception (senses) as a kind of ‘sub-spaces of intuition’: the ‘Gesichtsraum’ (space of sight), the ‘Tastraum’ (space of touch) and the ‘Bewegungsraum’ (space of movement). Within this differentiation of the ‘space of intuition’, for Schmarsow, the space of touch represents the ‘Eigenraum,’ that is, the actual subjective space of each human being—the spatial zone that is determined by the reaching area of the extremities. The ‘space of sight’, determined by forward-facing visual perception, transcends the ‘space of touch’ and penetrates the surrounding general space in a mere visual way. Here, however, and since it penetrates the surrounding space apart from the ‘sense of touch’, Schmarsow describes the ‘space of sight’ as being of a three-dimensional quality only in a scenic sense. This means that it contains a distinction in foreground and background as well as on intermediate planes of the images in between. It gains real three-dimensionality in synthesis with the ‘space of movement’ or at least with the visual imagination of this movement. In such a state of (virtual) successive walking through space, Schmarsow’s ‘Anschauungsraum’ turns out to be a dynamic space of perception within a static general space, within which the element of movement into depths plays the pivotal role.

According to his approach to come up with an ‘aesthetics from within,’ Schmarsow now applied his conception of ‘Anschauungsraum’ to the realm of architectural design and refers to the space of intuition, particularly in the dimension of bodily movement into depth, as the basis of the artistic creation of architectural space and explains the built space as a *projection* of the three-dimensional subjective space of intuition into general space. ‘Raumphantasie’ (spatial fantasy) and ‘schöpferischer Trieb’ (creative instinct) complement the causal connection between a three-dimensional constitution of man and the creative act of space formation to a complete system of a specific aesthetics of architecture. It is a system that unites perception and artistic creation and conceived to be (nature-)scientifically founded. Correspondingly, Schmarsow eventually conceives the built space as a creative *equivalent* of

man's corporeal constitution and the associated physiological–psychological being in space—an equivalent that *objectifies* the space of intuition in the shape of a defined space with the quantified potential of corporeal movement and where man finds himself back as an ideal projection in the shape of the vertical middle axis, thus defining the centre of that space:

As the creatress of space, architecture creates, in a way no other art can, enclosures for us in which the vertical middle axis is not physically present but remains empty. It operates and is defined as the place of the subject ... The spatial construct is, so to speak, an emanation of the human being present, a projection from within the subject, irrespective of whether we physically place ourselves inside the space or mentally project ourselves into it...⁷⁹

The 'genetic' explanation of architecture as the 'creatress of space' out of the inside, i.e. the inner organisation of the human being goes that far that for Schmarsow:

Its roots lie at the very place where the origin of our mathematical thinking, the psychological basis of the science of space, is to be sought. Art is different only in that it immediately strives to translate the inner intuition into an actual phenomenon - the visible indication, designation and enclosure of a spatial area within a general space; ...⁸⁰

In-between conclusion

By reducing the human subject to its spatial constitution, its orientation, and its movement in space, Schmarsow succeeds, in my opinion, to more clearly define the aesthetic relation between human beings and the built space. Here, the definition of the vertical middle axis as the point of origin of the (sensuous) perception of space and of spatial depth is of essential significance: The perception or rather experience of space (in terms of three-dimensionality) is recognised as to emanate from this axis, either in terms of its visual–corporeal perception from a fixed position or in the state of movement. In my opinion, the resulting essential value of Schmarsow's approach is that it also allows for more clearly understanding the perception of architectural space as a dynamic experience of two modes of a spatial enclosure: the enclosing of the built space and of the perceiving subject itself. Moreover, with his theory, Schmarsow transcends a merely object- or form-oriented aesthetics that distinguishes him, for instance, from Heinrich Wölfflin and his theory of the sensuous perception of architecture.

⁷⁹ Schmarsow, 1893, 15.

⁸⁰ Ibid, 11.

At the same time, however, Schmarsow's explanation of the creation of enclosed space as a built projection of the 'space of intuition' into physical space certainly is an oversimplification of the relation between the fundamental spatial constitution of man and the creation of architectural space. It is an oversimplification that makes this constitution and the human intuition of space an absolute. Particularly the claimed identities of the vertical axis of man and built spaces illustrate this. Nevertheless, I would like to argue that Schmarsow was partially right in claiming that the fundamental spatial constitution of man and his perception of, and orientation and movement in, space essentially influences the creation of architectural space. In my opinion, however, it does so not in a direct but rather in an indirect and reacting manner. In this sense, one may state that the relation between spatial constitution and perception, on the one hand, and the creation of architectural space, on the other hand, form an interrelation. It is an interrelation, in which the determining influence of the first on the latter remains. In this way, however, Schmarsow's conception of the fundamental human relation to space remains fundamentally relevant for explaining the subject-object relation between man and architectural space.⁸¹

Recognising the socio-spatial meaning of space formation

Schmarsow's notion of the creation of architectural space seems to have been diametrically opposed to the generally accepted notion that the very origin of space formation is the purposeful enclosing for protection and privacy. And indeed, although Schmarsow principally acknowledged this purposeful meaning, he insisted on the primacy of the spatial conditionality of man being the actual origin of the creation of enclosed spaces. At the same time, however, he himself seems to have felt the underestimation of the significance of the purposive function of space formation. At least, we may deduce this from his acknowledgement of the significance of space formation to create a private space of movement within a surrounding general and thus public space:

⁸¹ Schmarsow's theory has been classified as one of the first contributions in the development of a Leib-oriented (body-oriented) concept of space within Western phenomenology (Wagner 2004, Friedrich, Gleiter 2007). Independent of this historical–philosophical context, it is, to my meaning, Schmarsow's non-ontological examination of the human relation of man to space and the corresponding limitation to the immediate corporeal–spatial constitution of man and the resultant perception or rather the examination of space on which the fundamental significance of his approach for architectural aesthetics is still grounded.

The four walls are the necessary boundary between our particular space and that general space out there, just they make the fenced-in spot of ground to our property, within which we centre ourselves from dissipation, being content with ourselves even by dispense with the wide world.⁸² The building of a solid, all-round running spatial construct around us (...) the guarantee of this fundamental (...) value of the intuition of space of the individual, as well as the spatial unity of all, that is the human being as equally organised persons, on whose communication we depend.⁸³

Although, as Fritz Neumeyer (2002, 54) also points out, Schmarsow's purposive reference to the enclosing of space remains confined to a subjective level, it contained—at least from the 'Grundbegriffe der Kunstwissenschaft' on, that is, since 1905—a clear socio-spatial understanding.⁸⁴ This also comes to the fore in his critique of the one-sided focus on enclosure, as it characterised the approach of Alois Riegl a.o.:

Especially the one who understands architecture as a functional art, should not mistake the practicality of interrelated rooms. We refer to the opening, may it be above, may it be in one or in several places, not as a negative feature, but rather as a gain of manifold relations pointing beyond the single room and connecting it to other spaces.⁸⁵

Paul Frankl's approach to integrate aesthetics and purposiveness at the space formation level

In his writings on architecture, Paul Frankl did not develop a theory on architectural space formation itself. He seems to have taken for granted that space formation, in particular the enclosing of space, represents a fundamental part of architectural design, both in aesthetic and in purposive use-related terms. Although he followed Schmarsow's statement that architecture principally differs from other visual arts in forming space, Frankl referred to architectural space and its formation as only one essential aspect of architectural design. In his well-known art-historical work *Die*

⁸² Schmarsow, 1905, 182.

⁸³ Schmarsow, 1919, 169.

⁸⁴ A quality of his approach that has remained neglected to this day. In this context, I also disagree with Beatrix Zug-Rosenblatt's statement that Schmarsow did not all refer to the enclosure in purposive terms (Zug-Rosenblatt, 2014). Both this and the corresponding argument that Hegel also would have referred to the enclosure only in ideal and symbolic terms (and on which Schmarsow ideal concept of enclosure would draw) are based on a too narrow understanding of the purposive meaning of the creation of enclosure.

⁸⁵ Schmarsow, 1905, 188.

Entwicklungsphasen der neueren Baukunst, published in 1914,⁸⁶ he generally assigns four fundamental attributes to buildings: the ‘Raumform’ (spatial form) of a building, its ‘Körperform’ (corporeal form), the ‘optische Erscheinung’ (visual form) of the latter, and the so-called ‘Zweckgesinnung’ (purposive intention) for which the building is built. Frankl places these four attributes in a specific order, within which the ‘purposive intention’ of a building takes - as the very aesthetic content of architectural design - centre stage. It is conceived as a content that gets artistically realised and expressed, and is eventually to be perceived via the ‘spatial form’ and its visual perception.

In this conception, architectural space formation is present in two respects. On the one hand, and in pure artistic terms, Frankl refers to space formation in terms of the arrangement and composition of spaces constituting the building’s ‘spatial form’. Here he distinguishes between two principle and opposed ways of composition: that of ‘Raumaddition’ (spatial addition) and that of ‘Raumdivision’ (spatial division). They are conceived to be opposed to each other: The first supports the spatial independence of various subspaces, while the latter, in turn, enables their integration into the spatial form as a whole.

With the application of this classification of a building’s architecture to architectural history he claims to explain the development of ecclesiastical architecture from Italian Renaissance until European Baroque in two opposed phases of space formation. As the first phase (1420–1550) is characterised by the principle of spatial addition, the following phase (1150–1700) is determined by the opposite one because:

*The components of spatial form are no longer complete, isolated addends, but fractions of a pre-existent whole. The space does not consist of many units; it is one unit divided into parts or fractions.*⁸⁷

As an integral part of this classification, Frankl consequently refers to space formation, that means to the composition of spaces, also in purposive use-related terms. However, he does so not at all in a socio-spatial respect, broaching the issue of the inside–out relation. For him, and as a result of his general reference to use in terms of use-related activity, the essential use-related function of space formation is to enable and to spatially organise the intended activity and not the realisation of protection or privateness. This specific reference to the purposiveness of architecture is underlined by introducing the term ‘Zweckgesinnung’ (purposive intention):

When I speak of purpose in architecture, I mean that architecture preforms the fixed arena for a specific course of activities, it provides the routes for a definite sequence in the activities, itself,

⁸⁶ Frankl’s habilitation, written under the supervision of Heinrich Wölfflin.

⁸⁷ Frankl, 1914, 71. (Quoted from the English edition, 1968.)

³⁵ Ibid, 143.

*and as they have their logical development, the succession of rooms, the passages and alleyways within each room have their logic, too.*⁸⁵

For Frankl, space formation—the composition of spaces—is involved in this functional relation between architecture and the activities of users, as for him the composition of spaces has the particular function to enable this activity. Moreover, he refers to the ‘spatial form’ as to bring the underlying purposive intention, the very aesthetic content of architecture, artistically to expression:

*The molded space is the theatre for certain human activities, and these are the focus of our perception. Once we have reinterpreted the optical image into a conception of space enclosed by mass, we read its purpose from the spatial form. We thus grasp its spiritual import, its content, its meaning.*⁸⁸

In this sense, Frankl directly links the ‘purposive intention’ of a building with architectural space formation and its visual perception. In this vein, Frankl did something that Schmarsow did not do. He connects both meanings of space formation, to which he referred. Most interestingly, he did so by taking over Schmarsow’s focus on the phenomenon of movement and by continuing to develop Schmarsow’s perception-related reference to movement into two directions: an artistic and a use-related direction. On the one hand, he refers to movement, or rather motion, as a pure artistic feature of architectural composition. Here he defines the composition of various subspaces of the ‘spatial form’ to compose a network of motion in and of spaces. He conceives such networks to be composed around middle points as well as along vertical, horizontal, and diagonal middle lines:

*which, in a schematic but concentrated way, indicate the prevailing motion ... When the space is composed by addition, this network of motion disintegrates into isolated static points strung along connecting, quiet, intermediary axes, and on the other hand, when the space is composed by subdivision, it becomes the arterial system of a continuous flow.*⁸⁹

On the other hand, Frankl links such motion to the use of space by referring to this use as an activity-related circulation within and through the spatial form. And with reference to the spatial network, he also refers to the activity-related circulation as a network of motion. Eventually, he links this use-related network of movement in space with the artistically composed network of motion in and of space. Here he argues that the latter ‘... is involved with actual purposes. The centre lines become paths through the space. They direct circulation between places equipped to serve appointed purposes.’⁹⁰ Moreover, for Frankl, both networks partially coincide and always stand ‘in a mutual dependence to

⁸⁸ Frankl, 1914, 15.

⁸⁹ Ibid, 141.

⁹⁰ Ibid, 141.

each other,⁹¹ whereby the latter informs the first as the underlying meaningful content. Frankl leaves it open which role this interdependence of both spatial networks of motion may play in the perception of the building's purpose through the visualisation of its 'spatial form'. First of all, he seems to have wished to point out the principal perceptibility of that 'purposive intention' of a building via the visual perception of its 'space form'.

Leo Adler's approach to integrate aesthetics and purposiveness at the space formation level

Leo Adler referred to space formation again in terms of the enclosing of space and as the very essence of architectural design. Furthermore, his approach coincides with that of Schmarsow as he traces the formation of space back to an underlying aesthetic source. Different to Schmarsow, however, he again defined the purposive function of the enclosure to represent the purposeful basis of architecture, both with regard to its emergence and development in history and in terms of the concrete design of buildings. As he put it: '*... neither spatial volume nor the erection of physical objects is the initial intention of building, but the protection of life from threatening dangers*'.⁹² Also different to Schmarsow, Adler related both the aesthetic source and purposive meaning of space formation. He did so at a design-related level, explicitly including the level of material production. This three-fold approach to architectural space formation resulted from his general interest in discussing the aesthetics of architecture in the context of the physical and form-related production of buildings rather than with regard to their sensuous perception. Furthermore, it resulted from his ambition to develop, in the truest sense of the word, a complete theory of architecture. It is a theory, which should unify architectural history and theory, but should also provide a normative quality for design practice. Implying this quality, this theory should help mediating between, what he called, the '*two faces of architectural theory as a pure and applied science*',⁹³ and, by so doing, making the science of art useful for architectural practice. As a result, his examination of space formation was only a part of a quite comprehensive theory on architecture.

Owing to this intrinsic connection between his reference to space formation and the superordinate theory of architecture, the explanation of his approach to integrate

⁹¹ Frankl, 1914, 142.

⁹² Adler, 1926-b, 39.

⁹³ Adler, 1926-a, 278.

aesthetics and purposiveness at the space formation level begins with the explanation of this overall theory. First, and as a 'pure science,' Adler attaches architectural theory to scholars of art, who are historians of architecture as well as art-historians in general. For them, according to Adler, a '*conceptual rational knowledge of architecture is the ultimate goal*'.⁹⁴ Their approach he characterises as moving from 'the inside to the outside', which means looking from the perspective of humanities and that of aesthetic perception. For them, the '*inner side of cultural experience is decisive, i.e. the emotional behaviour of the human subject, evoked by the architectural object, acting as a stimulus*'.⁹⁵ Second, and as an 'applied science,' he attaches architectural theory to (practicing) architects. They start, according to him, from the built or to be built object and move, by so doing, from 'the outside to the inside'. They approach the 'cultural and spiritual identity' of architecture from the material-technical side. For them, the '*outer side of the culture is important. (...) It includes... in particular the technical, economic etc. conditions to realise concepts of space and architectural forms*'.⁹⁶ In their synthesis, both perspectives constitute a theory of architecture as an entity of architectural theory and practice. Adler conceives this synthesis as an epistemological development in which the purely art-historical perspective provides the conceptual basis for the practical questions of architectural science. It does so by '*defining the essence of building art, (...) definitely and irreversibly*'⁹⁷ and by which the pure scientific task of architectural science would be solved, namely '*to support and to expand and, just by so doing, to fertilise the imagination of the creative person*'.⁹⁸

To indeed realise such synthesis, Adler proposes to add a third complementary element to the differentiation between the history and the aesthetics of architecture: the theory of the 'morphology of architecture'. As a result, he complements the synthesis of 'aesthetics': '*the theory of the impression of architectural form ...*' and 'history': '*... the theory of the temporal and spatial changes of architectural form...*' with the constituent element of 'morphology': '*... the theory of the essential architectural 'Gestalt' (shape) as*'.⁹⁹ He conceives the latter as a yet to be developed 'Gestaltlehre' (theory of shape). Here he emphasises the difference of a theory of morphology with 'Gestaltungslehre' (theory of design), and in particular, with composition as the existing design knowledge.

⁹⁴ 1926-a, 278.

⁹⁵ Ibid, 276.

⁹⁶ Ibid, 276.

⁹⁷ Ibid, 278

⁹⁸ Ibid, 278.

⁹⁹ Ibid, 281. Adler refers to the concept of morphology

He does so because for him, morphology does not at all imply form-oriented aesthetics and thus the realm of artistic expression in and by architectural form.¹⁰⁰

In this three-part system, Adler assigns (the theory of) morphology the role to represent the basis for both history and aesthetics of architecture and to take, by so doing, the central position within architectural theory as a whole. The essential matter of such (theory of) morphology is to come up with a classification of all basic shapes in architectural production. Here he uses the term ‘type’ in terms of basic types of architectural shape that may indeed appear in countless variations throughout history. At the same time, these types are believed to be constant in their essential characteristics and thus de facto monomorphic (in the sense of being immutable). Since for Adler architecture essentially implied the creation of enclosed space, he basically describes architectural shapes as space-forming shapes. In this sense, he defines the (theory of) morphology as ‘*a system of all spatial possibilities, which are of particular importance for the architectural built form*’.⁴⁸ It is a definition or terminology, as he writes, with which he believes to have found the solution to connect an art–scientific approach to architectural design—both in aesthetic and purposive respect—with the practical level of design.

Pointing to the built form as a space-forming shape, Adler identifies architectural space as representational, object-like space - as a quality of space that principally exists in synthesis with its material limitation: the space-enclosing built form. In the context of the - at that time - generally accepted dualism between an enclosed hollow space, on the one side, and a space-forming built form, on the other side, Adler explicitly pointed out that space and form formed one impartible entity. As he put it: ‘*An architectural concept of space is principally concrete and for this very reason it is necessarily bound to the materiality of its boundaries*’.¹⁰¹ In order to emphasise the solid nature of the space-enclosing boundary, he describes it as ‘Blockfläche’ (block surface). He does so because although the boundary limits the enclosed space in a two-dimensional way, it is of a three-dimensional shape. Next to his fundamental approach to develop an overall theory of architecture, it is - in my opinion - this fundamental insight that

¹⁰⁰ Adler’s concept of ‘Gestaltlehre’ included, not at all, a perception–psychological approach to architectural shape. In this respect, it was also not related with the development of the so-called ‘Gestalt theory’ by Max Wertheimer and others that was applied to architecture just from the 1970s on (Arnheim, 1977, Weber, 1995.)

⁴⁸ Adler, 1926-a, 284.

¹⁰¹ Ibid, 283. Adler explicitly refers to this dualism and argues that with this still hardly recognised fact: ‘*The well-known question, whether the limitations or the space itself is the decisive element of architecture and of its history and aesthetics, becomes meaningless*’. (Adler, 1926-a, 282.)

distinguishes him within the art-scientific architectural discourse and the included examination of space formation. It is an insight that we find, explicitly formulated, back only half a century later in the architectural theory of Dom Hans van der Laan.¹⁰²

However, and what brings us to the way how Adler linked the use-related meaning of space formation with the realm of aesthetics, this apparently pure formal synthesis of the built space and form includes the following connection between that use-related meaning and the realm of aesthetics. First, Adler refers to the built form as the *form* of a certain artistic content. As such artistic content he identifies the purposeless and pure aesthetic 'Raumidee' (aesthetic notion of space) as well as the purposive use-related meaning of space formation. Here he argues:

As the desire for space (Raumwille) is the living soul¹⁰³ of the architectural creation (thus an ideal moment), (...) the need for space is also of space-forming creativity, and to this materialistic moment, to stay in the picture, should be attached the just as vibrant physical shape of a building.¹⁰⁴

Concerning the pure aesthetic 'Raumidee' (aesthetic notion of space), Adler adopts Schmarsow's notions of 'Raumwille' (desire for space) and 'schöpferischen Trieb' (creative instinct). Yet, he does not follow Schmarsow's more concrete approach towards the aesthetics of space formation, by which that desire for space gets complemented by a sense of space and gets linked both to a human 'space of intuition' and the underlying corporeal constitution in space. Determined by a general differentiation between an ideal and a materialistic moment of architectural space formation, the ideal 'aesthetic notion of space' gets completed by the purposive 'need for space' as the second source of its architectural implementation. Adler avoids evaluating the artistic significance of the purposive need, on the one hand, and of the desire for space, on the other, and refers to both as the content of architectural design, which he finally defines as a '*... physically purposeful designing of space, by converting an aesthetic and purposeless spatial notion (in the condition of the three-dimensionality of empirical space) by the erection of three-dimensional block surfaces*'.¹⁰⁵

¹⁰² Compare introduction page ...

¹⁰³ Quoting Schmarsow. *Barock und Rokoko*, 1897, 7.

¹⁰⁴ Adler, 1926-b, 25.

¹⁰⁵ Adler, 1926-a, 59.

2.3 Conclusion: Schmarsow's, Frankl's and Adler's Approaches to Space Formation from the Perspective of the Socio-Spatial Aesthetics of Space Formation

Although all three of them refer to space formation in the context of three differing superordinate theories of architecture, they recognise a certain use-related meaning of architectural space formation. Adler refers to the enclosure's protective meaning of to provide protection from 'threatening dangers,' whereas Schmarsow points to the socio-spatial significance of the enclosing and opening of defined spaces. Frankl, in turn, identifies the use-related meaning of space formation to provide space for use-related activity.

On the one hand, and although Schmarsow acknowledges a certain socio-spatial meaning of space formation, as Adler acknowledges an aesthetic notion of space, it is only Frankl who conceives the purposive meaning of space formation as an aesthetic content, that is, as a content of perception and aesthetic experience. As a result, only his approach contains the attempt to indeed integrating the purposiveness and aesthetics of architecture. Adler, instead, refers to the purposiveness and aesthetics of architecture as two equal causes of architectural design thus space formation. His kind of linking the two clearly neglects the realm of (sensuous) perception of architectural space.

On the other hand, however, I want to point to certain deficits in Frankl's approach. First, in his reference to space formation, he neglects the inside-out relation and correspondingly leaves the socio-spatial meaning of space formation completely aside. Accordingly, in his reference to space formation the aspect of enclosed spatiality and that of outside orientation is also absent. Next to this, his reference to the realm of perception is—in comparison with Schmarsow's conception—rather general and abstract; if at all, he refers to the sensuous perception of architectural space in terms of visual perception. As a result of his actual aim to continue developing Schmarsow's reference to movement in a distinctly purposive direction, his reference to movement completely neglects its perception-related significance. Yet, just the immediate corporeal movement through space seems to me the indispensable element to understand, and accordingly to explain, how the spatial-artistic network of motion gets as such sensuously perceived, and how both networks superimpose each other: namely at the moment of their immediate experience by physically moving through and acting in space - or by the imagination of both. Without this, the centre lines and paths just remain abstract artistic elements.

Finally, and continuing the in-between conclusion, this Chapter results in the statement that with his theory of the human perception of (architectural) space,

Schmarsow did not only succeed at more clearly defining the aesthetic relation between human beings and built space and to transcend a merely object- or form-oriented aesthetics, as concluded before. Moreover, his approach may also contribute to a more thorough understanding of how we perceive the socio-spatial meaning of space formation and accordingly of its integration in the aesthetic experience of architecture: Just as we perceive the pure spatial content of a space-forming structure by means of its immediate visual and corporeal experience, we also perceive its socio-spatial meaning in such a synthetic way. We do so because our fundamental constitution and orientation in space determines not only our spatial perception, including the perception of architectural space. In addition, it also forms a constituent part of the spatial condition of our *social* being. This means that, for instance, the spatial (architectural) manifestation of a socio-spatial separation and distance, as well as of a social-spatial connection and proximity, necessarily implies a concrete visual perception and corporeal experience. The same goes for the moment of the appropriation of particular places and the corresponding spatial manifestation of inclusion or exclusion.

As a last comment, I wish to point to the apparently paradoxical situation that it is Schmarsow's approach—the approach that least includes an appreciation of the purposive meaning of space formation—that turns out to be the most indispensable to understand how the use-related and socio-spatial meaning of space formation is indeed integrated in the perception of architectural space, thus the aesthetic experience of architecture.

‘Man invents the fictitious space of illusiveness, of inner visions and ideas by means of his intuition, by the metaphysical power that he draws from the universe; he feels the correlation between the modes of its appearance, of colours, tones and sensualises with them laws, dimension and numbers. However, this space of vision urges to its implementation in the material world; with mind and craft the material is conquered’.

Walter Gropius, 1923

‘The original elements of space are: number and motion. By means of number man is able to distinguish objects, is able to understand and structure the material world. Just through divisibility, the object comes off from the primary substance and receives its own shape. (...) The force we call motion, puts the numbers in order. Both number and motion is a conception of our finite brain, which is not able to grasp the concept of infiniteness’.

Walter Gropius, 1923

3 WALTER GROPIUS'S APPROACH TO (THE PERCEPTION OF) SPACE

This Chapter deals with Gropius's view on the human perception of (architectural) space. Although he always seems to have recognised space as an essential category of architectural design, an explicit statement on architectural space is quite rare in the large collection of Gropius's statements on architecture produced over a period of more than 50 years. Correspondingly, a theoretical preoccupation with space in terms of its perception also is quite rare and confined to only a few statements. Nevertheless, these few statements show that Gropius dealt with this subject. Furthermore, they indicate that he approached (the human perception of) space in two different ways or from two different perspectives: from the perspective of the designing architect and thus in relation to the 'production' of space; and from that of the human being in general and thus in relation to its 'consumption'. But despite its orientation towards the 'production' or rather the creation of architectural space, the first perspective may also be classified as perception-oriented—oriented towards the intuition of the designing architect. Gropius neither linked these two perspectives with each other, nor did he make a clear distinction between both. Nevertheless, this two-fold approach characterises, among others, his manner of dealing with space as a new and modern paradigm of architectural design.

The first perspective was developed by Gropius on the basis on Herman Sörgel's theory on the aesthetic perception of space, where he transferred this approach, as it were, at a different level. Owing to this direct content-wise relation, an explanation of this perspective includes the explanation of Sörgel's view. The second perspective—intrinsically tied to his definition of space by the two terms 'motion' and 'num-

ber’—appears in one text only and without any reference to a specific theory or theorist. It may be situated, however, in the preoccupation with space within the Neues Bauen, although affiliated artists rather than architects dealt with space at such a conceptual level like Theo van Doesburg and László Moholy-Nagy. Therefore, and since particularly in relation to them the specificity of Gropius’s second perspective may be illustrated the best, this second perspective includes the explanation of their views on space.¹⁰⁶ As the first part of comparing Gropius’s and Van Eyck’s approach with each other and reflecting both in relation to the approach of Schmarsow, Gropius approach to the perception of space is also compared with Schmarsow’s view.

3.1 A Perception-oriented Approach to (Architectural) Space

It was at the beginning of the Bauhaus period that Gropius delved into the subject of space to find its meaning in the context of architectural design. In 1921, and as a first attempt to set up an architectural class at the Bauhaus,¹⁰⁷ Gropius initiated a lecture course with the title ‘Raumkunde’ (space theory). Although his statements remained at a quite general level,¹⁰⁸ he succeeded to formulate (as an integral part of this course) his own concept of the human perception of space. This approach formed the basis of a design-related approach to architectural space. In this context he identified the creation of architectural space as the essential artistic content of architectural design and thus as the essential task of the designing architect.¹⁰⁹

In this concept, Gropius defines (the creation of) architectural space as comprising three fundamental human relations to space. First, he distinguishes a sensuous or rather visual perception of space by perceiving space as an objective reality outside ourselves. Second, he names the rational recognition of space by the human mind in the shape of its three-dimensional mathematical construction; and third, he defines

¹⁰⁶ Since an additional comparison with Le Corbusier’s and Sigfried Giedion’s views on space would not have led to a better understanding of this specificity or would even have distracted from this, a discussion of either views has been avoided here.

¹⁰⁷ A plan that was not realised, however, until the appointment of Hannes Meyer as a head of a separate department of architecture in 1927.

¹⁰⁸ This assessment is based on an existing manuscript of this course that is confined to some essential notes.

¹⁰⁹ That Gropius developed his own approach we can also conclude from the fact that he did not at all refer to the construction-related theory of space formation of Paul Klopfer (Klopfer, 1926), who, owing to an initiative of Gropius, had a lectureship at the Bauhaus until 1922.

an inner vision and psychological intuition of a so-called 'fictitious space'. According to this differentiation into three fundamental human relations to space, Gropius distinguishes three types of space: 'physical space', 'computable or mathematical space', and 'transcendental space'. For Gropius, these three spaces and the corresponding human relations to space also constitute the 'artistic space' of the designing architect and hence his relation to the creation of architectural space. As Ulrich Müller points out, Gropius's three-part concept of the human relation to space seems to have been strongly influenced by the reading of Herman Sörgel's *Architekturästhetik* where we find a similar three-part system of the perception of architectural space, published in 1918, three years prior to Gropius's first lecture on 'Raumkunde'.¹¹⁰ Owing to the essential significance that Sörgel's conception had for Gropius, I first explain this conception before continuing with the explanation of Gropius's approach. Since his reference to Sörgel's argumentation is quite selective and limited to his three-part system of perception, my explanation of Sörgel's argumentation also focuses on this part.

Herman Sörgel's three-part system of perception

Sörgel's approach to architectural space is characterised by a combination of the definition of architecture as 'raummäßige Kunst' (space-determined art), as he called it, and a specific approach to the general human perception of architectural space and its formation. Here Sörgel claimed to have applied a true phenomenological approach. An approach, which should make more concrete Schmarsow's and preceding scholars' common concept of physio-psychological perception. In this respect, he argues that '*by the means of immediate perception, phenomenology (...) wants to recognise the aesthetic values in their objectivity*'.¹¹¹ Based on this basic perspective, Sörgel assigns to human perception a certain normative quality and the implied potential of an objective assessment. The special thing in Sörgel's resultant classification of human perception is its composition out of three complementary types or 'contents of perception': a psychological, an intellectual, and a visual 'Wahrnehmungsgehalt' (content of perception). These three contents of perception he qualifies by linking them to: emotional experience (of the soul), intellectual understanding (of the mind), and optical

¹¹⁰ Müller, 2004, 36. Gropius himself nowhere mentioned this obvious reference to Sörgel.

¹¹¹ Sörgel [1921] 1998, 119.

perception (of the eye). *'Or in more general words: the depth (of the content), the functionality (of the purpose), and the perfection (of the form).'*¹¹²

The 'psychological content of perception' is primarily identified by Sörgel with the perception of beauty, which is additionally qualified with the artistic categories of 'character' and 'sublimity'. The 'intellectual content of perception', in turn, *'is predominantly based on purpose, material and construction'*.¹¹³ Yet, he conceives it to be present only in the *'appearing properties'* of purpose, material, and construction. This is because in terms of the intellectual perception of architecture or architectural space, for Sörgel, *'the significance of the architectural phenomenon just consists in the fact that it satisfies the laws of the intellect, on which the phenomenon is based, in an autonomous manner'*.¹¹⁴ The 'visual content of perception,' in turn, mainly exists in the visual perception of physically defined space. Here he also connects to this content of perception a principal aesthetic quality and refers to it as an artistic viewing and basically different from a mere *'inartistic, optical detection of things'*.¹¹⁵ Correspondingly, for him the 'visual content of perception' is, in itself, of aesthetic quality. It is a quality, or aesthetic seeing, that may be trained.

Based on the principle understanding of architecture as a space-determined and thus space-forming art, and in line with Schmarsow's reference to sight, touch, and motion as corresponding 'spaces'—Sörgel connects his three contents of perception with three types of space. According to this logic, he identifies the visual perception of space with the phenomenon of the 'Wirkungsraum' (space of impression). He distinguishes this 'space' from the pure intellectual 'Daseinsraum' (space of existence) and the mere physical 'Erscheinungsraum' (space of appearance). Sörgel now conceives all three self-consistent modes of perception as complementing each another in one and the same process of perception. Here the psychological content of perception takes a central position because for Sörgel *'with the soul aesthetics and the artistic crept into the before just purposive construct of the human being'*.¹¹⁶

Gropius application of Sörgel's conception

In Gropius' adoption of Sörgel's three-part system of perception, the similarity lies in the three-part relation between human being and architectural space: a psycholog

¹¹² Sörgel [1921] 1998, 133.

¹¹³ Ibid, 161.

¹¹⁴ Ibid, 131.

¹¹⁵ Ibid, 182.

¹¹⁶ Ibid, 184

ical, an intellectual and a visual relation in the case of Sörgel; a transcendental, a computable and an optical relation in the case of Gropius. In this way, both distinguish an emotional intellectual, and physical–visual relation of man to (architectural) space. Furthermore, both systems imply a holistic understanding of this relation, comprising mind, body, and soul, although the reference to the body is confined to the eye.

Nonetheless, Gropius's conception clearly differs from that of Sörgel, as Gropius - by dealing with the artistic–productive level - transfers Sörgel's perception-related approach to the active process of the architect to artistically creating architectural space. As a result, the coinciding definitions substantially differ in their specific interpretations. To the intellectual relation between man and architectural space, for instance, Sörgel refers in terms of a rational recognition of space, recognising its nature of physical production and use-related purpose. Gropius, in turn, refers to the intellectual relation to architectural space in the sense of a rational construction of space, constructing space geometrically by means of its mathematic–analytical examination, its measuring, and computation.

On the occasion of the first Bauhaus exhibition, in 1923, Gropius incorporated his concept of the architect's 'artistic space' in his contribution to the catalogue of that exhibition.¹¹⁷ Here he explicitly explains 'artistic space', thus the creative process of an architecture-artistic creation of space, as being constituted by those three different human relations to space. Furthermore, and in line with Sörgel's qualification of the psychological content of perception, he defines the psychological intuition of space as the main source of this creative process—a source that rushes to its physical implementation by means of the intellect and thus by means of geometry and proportion:

Man invents the fictitious space of illusiveness, of inner visions and ideas by means of his intuition, by the metaphysical power that he draws from the universe; he feels the correlation between the modes of its appearance, of colours, tones and sensualises with them laws, dimension and numbers. However, this space of vision urges to its implementation in the material world; with mind and craft the material is conquered.

By virtue of the intellect, the brain conceives of the mathematical space through calculation and measurement. Via the laws of mathematics, optics and astronomy, and the instrument of drawing, it creates a means of vision and representation for the material built space of reality.

The hand grasps the tactual material space of reality, which lies outside ourselves; it builds this space in reality according to the laws of substance, mechanics and measures, and weighs up the

¹¹⁷ Gropius, [1923] 1987, 83–92.

*material substance, by which it is defined, its solidness as well as its mechanical and constructional features. It copes this space by the skill of trade and by means of tool and machine.*¹¹⁸

However, the creative process of the intuition and the design of space is principally simultaneous in nature ... Only the one, who's knowledge and skill respond to all natural laws of statics, mechanics, optics and acoustics, and who finds in their combined mastering the steady instrument to incarnate the spiritual idea, he carries inside, is capable to create the world simultaneously find their solution'.¹¹⁹

To connect, in this way, the realm of (aesthetic) perception with the artistic realm of rational design and material–technical execution principally distinguishes Gropius as a practicing architect who principally referred to aesthetic theory with the aim of making it fruitful for artistic practice. This brings us to the way in which Gropius approached the perception of space from the general perspective of human beings, and which indicates his rather limited way of referring to the sensuous perception of space: it is limited to a psychological–mental perception. A similar limitation also characterises Hermann Sörgel's approach, as it characterises Paul Frankl's and Leo Adler's corresponding views on the sensuous perception of space.¹²⁰ This coincidence, in turn, indicates the exclusive position of Schmarsow within the whole group of theoreticians and architects around and within the Neues Bauen who dealt with this subject.

Gropius's pure psychological 'space of intuition'

Gropius's non-reference to the sensuous perception of space becomes clear in a direct relation with Schmarsow's aesthetic theory. On the one hand, Gropius has with Schmarsow (and Adler) in common the notion of a particular human intuition of space. However, for Schmarsow, that intuition is directly linked to the corporeal, that is, the anatomical–physiological constitution of man in and his perception of space, constituted by the senses of sight and touch as well as by real and imaginary movement in space.¹²¹ In Gropius's approach this direct linking does not exist, as there does not exist any reference to the immediate sensuous perception of space. Rather, Schmarsow's integration of the sensory perception and corporeal examination of space is 'replaced' by a pure psychological concept of perception that takes

¹¹⁸ Gropius, [1923] 1987, 84

¹¹⁹ Ibid, 84.

¹²⁰ Compare: Chapter 2, 2.2 Relating Aesthetics and Purposiveness.

¹²¹ Compare: Chapter 2, Ibid.

an inner feeling or vision of space as the very basis of the ‘space of intuition’. Accordingly, Gropius does not refer to the human sense of self as being linked to any kind of body-related constitution in and perception of space.

Another example of such a complete inner feeling of space—a feeling that is regarded as the psychological source of a creative process—we recognise in the approach of Gropius’s Bauhaus colleague Oskar Schlemmer as explained in his book *Die Bühne im Bauhaus*, which he published together with Moholy-Nagy in 1925. It is worth mentioning this example, since Schlemmer very well refers, at least in a certain way, to the anatomical–physiological constitution of the human being, which, in his case, is that of the dancer on the stage. But interestingly, he conceives the corresponding aesthetic intuition of space as to develop again completely independent of the constitution and orientation in the surrounding space. In his understanding, this intuition rather originates as an ‘imaginary space’ exclusively from the *inner* corporeal feeling and the functioning of the human body. As such it ‘emanates’ into the surrounding space by means of corporeal motion and expression. In the truest sense of the word, the surrounding space turns into a stage thus into a background of that imaginary space. And although Schlemmer points out that the ‘*der Tanzmensch* (dancing man) *follows the law of the body as the law of space; the sense of himself as the sense of space*,¹²² he consequently defines that imaginary space as just being opposed to architectural space. For him, it is opposed to the latter, since for the non-architect Schlemmer, architectural spaces represents a pure mental and therefore a scientific construction. Consequently, he just excludes the vertical axis of the human being from its sense of self and relates it to the ‘opposed’ realm of what he calls abstract space.

Motion of space instead of corporeal movement through space

The absence of the fundamental physical–spatial constitution of the human subject also characterises Gropius’s reference to motion. In this regard, he refers to the motion in and of space, instead of whatever form of human movement in space.¹²³ In a lecture, which Gropius gave in Geneva in 1933, we find an architecture-related

¹²² Schlemmer, [1925] 1965, 15.

¹²³ ‘Movement’ essentially differs from ‘motion’ as to represent an active mode of motion, that is, requiring a force that cause the motion, for instance, mechanical or corporeal power. Although this differentiation in the German-language does not exist, and in both meanings the term ‘Bewegung’ is used, Gropius nowhere uses ‘Bewegung’ in combination with space in terms of an active mode of motion.

explanation of this reference, although it is via a quote of László Moholy-Nagy. But Gropius explicitly introduces this quote as the best definition of ‘a modern feeling of space’.¹²⁴ Under the sub-title *Instead of statics: kinetics*, Moholy-Nagy had written in his well-known Bauhaus publication *Von Material zu Architektur* from 1929:

*Formerly the architect constructed his buildings from visible, measurable, and well-proportioned volumes, calling them ‘space creations’. But real spatial experience rests on simultaneous interpenetration of inside and outside, above and beneath, on the communication between inside and the outside, on the often invisible play of forces present in the materials and their relationships in space. (...) Space creation is an interweaving of the parts of space, which are anchored, for the most part, in clearly traceable relations of motion, extending in all directions as a fluctuating play of forces. The structuring of this space creation is put into effect: on the measurable plane by corporeal limitations, and on the non-measurable plane by the flowing fields of force.*¹²⁵

A similar reference to motion, in terms of the fluid interpenetration of inside and outside spaces, is to be found several years later in the above-mentioned article of Gropius, namely ‘Is there a science of design?’:

*It is evident that motion in space, or the illusion of motion in space produced by the artist’s magic, is becoming an increasingly powerful stimulant in contemporary works of architecture, sculpture, painting and design. In architecture today there is a preference for transparency, achieved through large areas of glass and through undercutting and opening parts of the building. This transparency aims at producing the illusion of a floating continuity of space. The buildings seem to hover; space seems to move in and out. Sections of the infinite outdoor space becomes part of an architectural space composition which is carried beyond the building into its surroundings. Space seems to be in motion.*¹²⁶

An important difference between both statements is Gropius qualification of ‘motion in space’ as an artistically created illusion. With this, he acknowledges that space itself cannot be in motion, but rather allows motion. At the same time, however, Gropius does not broach the issue that the created illusion of motion in space is

¹²⁴ Gropius, 1933, 10.

¹²⁵ Moholy-Nagy, 1929, 211. Quoted from the third revised edition, 1946, 62. A first English version was published under the title *The new Vision* in 1930.

¹²⁶ Gropius, [1947] 1955. As Zurfluh (2009) remarks, the term ‘fluid space’ was established as a design-related term just in the ‘40s—first in the writings of Johnson, Giedion, and Hilbersheimer, and then, linked, in the first instance, with Mies van der Rohe’s architecture, in particular of the house Tugendhat and the German Pavilion at the international exhibition in Barcelona, 1929. Therefore it also appears in the case of Gropius just in this post-war text. One exception is the speech of the music- and art-historian Walter Riezler at the fourth congress of the journal ‘Zeitschrift für Ästhetik und allgemeine Kunstwissenschaft’ in Hamburg in October 1930. Nonetheless, this term very well describes the idea of motion in space, as being already present in the ‘20s within the Neues Bauen.

intrinsically tied to the imagined motion of physical objects or the imagined movement of the perceiving subject itself.

Corresponding to his neglect of the level of the corporeal existence of man in space and of motion as corporeal movement in space, Gropius neither refers to 'time' as an integral aspect of the sensuous perception of space.¹²⁷ This means, that he does not link the perception of a spatial structure of a building, and the corresponding motion in space, with the aspect of moving around and/or through this structure within a certain period of time. This is worth mentioning, since it underpins my assessment that it is the pure psychological manner of referring to the realm of human perception that characterises Gropius's approach.

Making space as such tangible

Although he exclusively refers to the perception of (architectural) space in psychological and mental terms, Gropius still differs from Moholy-Nagy by arguing from the perspective of human perception. Accordingly, Gropius refers to the phenomenon of motion as a specific human way of grasping space in itself, that is, in its all-sided (infinite) extension. On this understanding, we find the term 'motion' in his aforementioned text for the catalogue of the first international Bauhaus exhibition in Weimar in 1923. In particular, he introduces motion as one of the two original elements of a general human vision of space:

*The original elements of space are: number and motion. By means of number man is able to distinguish objects, is able to understand and structure the material world. Just through divisibility, the object comes off from the primary substance and receives its own shape. (...) The force we call motion, puts the numbers in order. Both number and motion is a conception of our finite brain, which is not able to grasp the concept of infiniteness.*¹²⁸

In this sense, Gropius modifies the notion of space as a superordinate absolute reality by emphasising the subjective perspective of the human being. At the same time, he still refers to space in its objectively all-encompassing reality and also conceives architectural space as the implementation of space in itself, even if in the form of a human vision of it. From this specific approach to the human perception of space follows Gropius reference to architectural space as defined partitions of space, which is simultaneously conceived as a means of making, in synthesis with motion, space as such tangible. In this regard, Gropius even assigns architectural space as a certain

¹²⁷ An exception is one article from 1947.

¹²⁸ Gropius, [1923] 1987, 84.

representational, object-like character. At least, we may deduce this from the above-mentioned text from 1947, where he argues that '*a harmonious relation between the building masses and the hollow portions of space, which they define or enclose, is the essential aspect of the architectural effect*'.¹²⁹

Although Gropius neglects the significance of the corporeal, that is, the anatomical–physiological constitution of man in space, his pure psychological manner of referring to the realm of human perception goes beyond a pure intellectual, rational perception of architectural space. In the aforementioned lecture, which he gave in Geneva in 1933, for instance, Gropius focuses in this sense on the psychological effect of light and colour on the perception of a particular architectural space. Referring to a new building of Marcel Breuer, Gropius points to the fact that '*in such an illuminated modern space with light walls the thousands plays of light and shadow on the walls fully effect the impression of the occupants*'.¹³⁰ Dark or isolating colours, however, would counteract this effect by absorbing much of this rich and vivid light. In more general terms, he argues that the artistic effect of form and colour entirely resides in the emotional effect that they evoke.

3.2 László Moholy-Nagy and Theo van Doesburg

In order to further illustrate the specificity of Gropius's approach to the perception of (architectural) space, I now enlarge on the way in which Moholy-Nagy dealt with space and its perception. Subsequently, I also give a analysis of Theo Van Doesburg's corresponding view. I refer to their specific conceptions of space, since both agreed with Gropius about referring and acknowledging space in its objective existence and appreciating its nature of openness and (potentially) unlimited motion. At the same time, and which allows for illustrating the significance of Gropius's approach, they differ as to how they make that objectivity absolute and accordingly refer to the realm of perception in a growing ideal and abstract manner and combined with an almost epistemological orientation. Here Van Doesburg goes the farthest, as we may position Moholy-Nagy in between him and Gropius.

¹²⁹ Gropius, [1947] 1955,

¹³⁰ Gropius, 1933, 11. Gropius refers here to the Breuers building for the 'Harnischmacher House' in Wiesbaden, built in 1932.

Moholy-Nagy: Perceiving space as such

In relation to Moholy-Nagy, this difference with Gropius comes first to the fore as he neither refers to architectural space in its representational, object-like character nor as a defined volume of (hollow) space. In the same text, which I cited above, he instead argues that *‘space is a reality, comprehensible and to be structured according to its own laws, it must be grasped in its fundamental substance,’*¹³¹ and continues that *‘the human being should have the possibility to experience in his dwelling the actuality of space’* and to which he simultaneously refers as the *‘... basis of the psychological well-being of the dwellers.’*¹³²

What Moholy-Nagy has in mind here is space in its physical reality of continuous (infinite) extension. And just in this fundamental dimension, he conceives space as being experienceable by each human being and as the essential artistic content of architectural design. He literally addresses architecture as to open up to us space in this fundamental existence: to appropriate ‘space’ as such, that is, to artistically possess it. Accordingly, Moholy-Nagy envisions future architecture as follows:

*Openings and limitations, perforation and movable surfaces tear the periphery to the centre and push the centre to the outside. A continuous fluctuation, sideward and upward, radial, all-side, indicates the human being – as far as its human relations and contemporary vision range – that is has taken possession of the imponderable, invisible and yet omnipresent space.*¹³³

Different to Gropius, Moholy-Nagy does not start from the perspective of the human subject, but from a superordinate concept of space and rather aims at bringing human perception at a higher, so to say, absolute spatial level. In this regard, he speculates about the future human capability to feel the *‘non-describable balance of bounded tensions’* and *‘the fluctuating each other penetrating spatial energies’*.¹³⁴ At the same time, Moholy-Nagy’s approach is notably characterised by the simultaneous aim of understanding space as a lived space, arguing that architecture must be understood *‘as a movable structure for the mastering of life, as an organic constituent of life itself’*.¹³⁵ Referring to life in a universal and biological meaning, he continues that *‘a solution will be reached just by the deepest insights in human life as a biological whole’*.¹³⁶

¹³¹ Moholy-Nagy, 1929, p.195. Quoted from the third revised edition, 1946.

¹³² Ibid, 197–98.

¹³³ Moholy-Nagy, 1929, p. 222. Quoted from the third revised edition, 1946.

¹³⁴ Ibid, 200.

¹³⁵ Ibid, 201.

¹³⁶ Ibid, 198–99. Yet, and as it will be more detailed explained with regard to Gropius at the end of the second part of this Chapter, aesthetic concept and socio-spatial aim remain separated from one another.

In the book *Von Material zur Architektur*, Moholy-Nagy still confines himself to space itself and does not deal with the subject of space–time, which, owing to his contact with Theo Van Doesburg, must have been familiar to him. In *Vision in Motion*, published 15 years later in 1946, he continues to develop his concept towards a space–time continuum. Interestingly, he emphasises the social and biological significance of this space–time continuum, arguing that

Space–time is not only a matter of natural science or of aesthetic and emotional interest. It deeply modifies the character of social ends, even beyond the sense that pure science may lead to a better application of our resources.

and continues that

*space or space–time experience (...) is a biological function, as important and as common as the experience of colour, shape and tone. Its connotations are numerous. There is, for example, the hope that it will help grasping future problems and vistas, enabling us to see everything in relationship, that it will furnish us with the right concept of cooperation and defence against aggression, where again space and time are inseparable intertwined.*¹³⁷

Van Doesburg: Space–time continuum

Gropius differs with his perception-oriented approach to space not only from Moholy-Nagy. In this respect, he also differs from Theo van Doesburg, for whom a superordinate concept of space also took centre stage and who also aimed at opening up a new spatial reality for mankind. What Van Doesburg's approach to space additionally distinguishes is that he takes up the idea of a four-dimensional space. He does so with the idea to artistically implement this natural-scientific concept of space–time and to make it aesthetically effective. Though in the work of Moholy-Nagy the notion of space–time gets, as explained above, a growing significance, Van Doesburg transforms this notion into a self-contained theory. In this theory, he assigns architecture the role of artistically implementing and expressing that notion.

Van Doesburg developed this theory on space, or rather space–time, as an artist, who, as many other artists of his generation, was fascinated by the idea to bring visual arts at a higher level—a higher and ultimate level of an evolutionary development of art throughout history. In the sense of a dialectical–historical development from the thesis via antithesis to synthesis, Van Doesburg identifies this evolutionary development as a three-part history of the spiritualisation of aesthetic experience. Starting

¹³⁷ Moholy-Nagy, 1946, 266.

from the so-called 'physio-plastic' style in the Hellenic period (wherein aesthetic experience represents itself as a non-spiritual content), he regards the so-called 'ideo-plastic' style in Gothic period (wherein aesthetic experience is merely a means of transforming a spiritual content) as the second, antithetical step towards the spiritualisation of art. The third and final step in this historical development is the to be continue developed 'neo-plastic' style: The style, wherein aesthetic experience and spiritual content are synthesised and the artistic means are indeed 'spiritualised'. From the latter, Van Doesburg, Mondrian, and many other contemporary artists derived the necessity that (future) art must be abstract in nature.

Since space indeed represents the most abstract form of aesthetic experience, it naturally took, for Van Doesburg, the central position in reaching this goal. Emancipating himself from Mondrian, who confined himself as a painter to the two-dimensional plane, Van Doesburg pursued an all-encompassing approach that almost necessarily brought him to the notion of a four-dimensional space-time as the very spiritual content of aesthetic experience. As Linda Dalrymple Henderson correspondingly remarks, for Van Doesburg and other young artists, *'the 'fourth dimension' (was) an important stimulus for their creation of a complete abstract art'*.¹³⁸

At the same time, a higher level of art meant that the spiritual content had to represent a highly developed level of insight. Therefore, Van Doesburg also linked spirit with a rational scientific world view, which was believed to give insights into what actually is taking place behind the limited realm of immediate visual perception and philosophical speculation. In this vein, Hermann Minowsky's mathematical explanation of space-time as a four-dimensional continuum (already formulated in 1908),¹³⁹ found its way into van Doesburg's philosophical examination of space. At the same time, however, the endeavor of creating a deeper insight into the nature of space had to be, according to Van Doesburg, an artistic one—this means that the kind of insight had to be aesthetically in nature.¹⁴⁰ With his theory of the so-called 'elementarism,' published in a series of articles between 1924 and '27, Van Doesburg eventually claimed to have found with the two- and three-dimensional diagonal (plane and space) this aesthetic equivalent of the scientific space-time concept of Einstein:

¹³⁸ Dalrymple Henderson, 1983, 195.

¹³⁹ Hermann Minowsky. *Raum und Zeit*, (1909).

¹⁴⁰ Simultaneously, it confirms the independence and (avant-gardist) significance of art. Interestingly, Gropius argues from an essentially intuitive-artistic perspective when he writes that: *'[M]an invents the fictitious space of illusiveness, of inner visions and ideas by means of his intuition, by the metaphysical power that he draws from the universe;...'*

*In the same way as the elementarism attempts to combine the static and the dynamic (rest and motion) in an harmonious way, also he strives for combining in a new dimension this two elementary factors of space and time. Whereas the possibilities of expression in Neoplasticism were confined to the two dimensions (the plane), elementarism opens the possibility for plastic design in four dimensions, at the level of space-time.*¹⁴¹

As a result, Van Doesburg eventually also ends up at the concept of motion, that is, of motion in and of space. At a conceptional level, he does so by taking up the concept of the so-called ‘hyperspace’, which comprises philosophical theories about a pure spatial fourth dimension from the late nineteenth century of Charles Howard Hinton and others.¹⁴² Preceding the scientific paradigm of space–time, these theories were also believed to open up and visualise a deeper insight into the nature of space. Essentially, Van Doesburg adds to this concept the diagonal as the very element of representing motion, or rather dynamic of space. The correspondingly proclaimed enhancement of Hinton’s theory finds its concrete expression in the correspondingly adjusted scheme of the so-called Tesseract from 1927.

At a concrete artistic level, for Van Doesburg, the resultant space–time architecture is based on the neutralisation of the house as a configuration of enclosed spaces, as he states:

*The new architecture is anti-cubic, that means it does not strive to combine the different functional space-cells in one self-contained cube, but throws the functional space-cells (including porches, balconies etc.) out of the centre of the cube to the outside, hereby height, width, and depth + time come to a complete new way of a plastic expression in open space.*¹⁴³

To realise such a spatial dynamics within the house and between the inside and the outside, Van Doesburg’s approach is particularly characterised by using colour as an additional instrument to bring enclosed space into motion in a concrete perceptible way.

*The new architecture organically integrates colour and as a direct means to express its condition in time and space. Without colour this condition does not become a vivid reality, is not visible. The balance of the architectural relations just becomes visible reality by means of colour. To organise this reality as a harmonious entity (not in a plane, not in two dimensions but in the new realm of 4-dimensional space-time) is the task of the modern painter.*¹⁴⁴

At least until Gropius left Germany in 1934, we do not find the term ‘space–time’ in his writings. He just refers to the notion of space–time in the already mentioned article from 1947. He does this in two ways: First, and in quite general terms, Gropius

¹⁴¹ Van Doesburg, in Dalrymple Henderson, 203.

¹⁴² Charles Howard Hinton, *The Fourth Dimension*, 1904.

¹⁴³ Van Doesburg, 1983, 96.

¹⁴⁴ Ibid, 97.

refers to 'space-time' as a paradigm that brings to the point the relativity of all '*human values and their continuous transformation*'¹⁴⁵ and the resultant insight that the essence of life is to be a continuous metamorphoses. Second, he refers to time as essential moment of the experience of space. Both references have in common that Gropius relates space-time, or rather time, to the subjective reality of man. He does so, by connecting time-related perception with the need for variety and accordingly argues:

*This change in our fundamental understanding of the world, away from the idea of a static space towards a continuous changing system of relations, stimulates our mental and emotional ability of perception,' and continuous that 'the introduction of the element of time into the configuration of space apparently enhance the intensity of the beholders experience.*¹⁴⁶

However, and confirming my above mentioned assessment: that it is the pure psychological manner of referring to the realm of human perception that characterises Gropius's approach,¹⁴⁷ the definition of what the beholder experience implies, and how time is related to this, remains completely vague.

3.3 Conclusion

Gropius approach to the perception of space is characterised by approaching space, which is conceived as an objectively given reality of unlimited spatial extension and potential motion, from the perspective of its subjective perception. We may herein distinguish between the particular perspective of the designing architect and that of man in general. From this ambition follows his general concept of space as number and motion by which the objectively given condition of pure three-dimensionality and motion is modified. The condition is modified to an interplay between (the perception of) unlimited motion and limited, perceptible portions of space—that is, portions of three-dimensional extension. This striving for mediation distinguishes Gropius from both Moholy-Nagy and Van Doesburg. He least aims at changing the perception or the experience of space for adapting it to new conceptions or realities of space.

At the same time, the specificity of Gropius's approach lies in the fact to referring to the realm of perception in mental-psychological rather than sensuous term. Owing to this orientation, this approach is also characterised by the neglect of the corporeal,

¹⁴⁵ Gropius, [1947] 1955, 37.

¹⁴⁶ Ibid, 37.

¹⁴⁷ Compare: Gropius's pure psychological 'space of intuition', page 106-107.

the anatomical–physiological constitution of man in space and its significance for the human perception of space. Furthermore, it is characterised by the resultant neglect of the experience of architectural space as a (relative) enclosure of the perceiving human being. With regard to the identification of space and motion and the human perception of the latter, Gropius also neglects the aspect of corporeal movement *in* space (and time). As a result, his concept of space as number and motion misses a fundamental part of the human perception and examination of (architectural) space. Following his perspective, this perception is reduced to a pure mental mode of perception, while the sensuous perception of spatial enclosure thus enclosed spatiality disappears, as it were, in the recognition of space as physically defined volumes or partitions of space. The sensuous perception of openness and outside orientation ‘dissolves’, in turn, into the recognition of space as motion.

What further distinguishes Gropius’s approach to the perception of space is that it additionally deals with the perspective of the designing architect. Gropius’s view on this specific perception of space complements his view on the general human perception. It complements this view in its neglect of the corporeal, anatomical–physiological constitution and orientation of man in space. This neglect is certainly informed by his perspective as an architect, his focus on the ‘production’ of architectural space, and the corresponding reference to the intuition of space as a mental and target-oriented instrument of its realisation.

‘A thing is determined by its essence. In order to design it, so that it functions correctly – a container, a chair, a house – first, its essence must be explored, because it should perfectly serve its purpose, i.e. practically fulfil its function, be durable, cheap and ‘beautiful’.

Walter Gropius, 1925

‘Construction means providing form for life processes. The organism of a house is derived from the sequence of events that take place in it. In a residence these are the functions of living, sleeping, bathing, cooking, eating, which necessarily give the whole design of the house its form. In railway stations, factories, and churches the processes are different, but it is out of them alone that the true form results. Building design is not for its own sake; it arises solely from the nature of the building, from the function it is meant to fulfil’.

Walter Gropius, 1927

‘By providing the best standards of ventilation and illumination, [man] only needs a small portion of living space, especially if this space is operationally well organised’.

Walter Gropius, 1929

4 WALTER GROPIUS'S (IMPLICIT) REFERENCE TO ARCHITECTURAL SPACE FORMATION

After having first dealt with Gropius's concept of (the perception of) space, the main subject of this Chapter is to explain his actual though implicit way to refer to space formation - both in theoretical as well as practical terms.¹⁴⁸ Gropius's first documented statement on space formation is to be found in a speech given at the Folkwang museum in Hagen in 1911.¹⁴⁹ In this speech, he primarily deals with a general artistic potential of contemporary industrial architecture, mentioning that the actual task of architecture is, next to the designing of material shape, '*... its necessary consequence, which is the limitation of space*'.¹⁵⁰ A similar statement he makes in the essay *Der stilbildende Wert industrieller Bauformen*, which he wrote for the annual of the Werkbund in 1914.¹⁵¹ In both texts, Gropius attaches to physicalness, and to the corresponding feature of impenetrability, the quality to generate and ensure a certain monumentality¹⁵² as well as a sense of security. Concerning this matter, he claims a potential for the (industrially produced) materials steel and glass, despite the rather anti-monumental as well as the principally transparent character of a corresponding building

¹⁴⁸ As explained in the introduction, instead of referring in my investigation to different 'concepts' of space formation, the term '(implicit) reference' is chosen. See: Introduction, page 14.

¹⁴⁹ Gropius, [1911] 1987, 28–51.

¹⁵⁰ Ibid, 29.

¹⁵¹ In: *Der Verkehr*, Jahrbuch des Deutschen Werkbundes 1914, 29–32.

¹⁵² Concerning this identification of industrial architecture with monumentality see paragraph: Towardss an architecture of Industrial Age.

construction. Gropius is convinced that *'with each material element one can generate physicalness,'* and accordingly argues that *'the artistic genius finds ways and means to create the feeling of security, even with the bodiless materials as glass and iron'*.¹⁵³

Throughout his whole career, however, Gropius seems to have regarded the aspect of a physical limitation and enclosing of space as an architectural implicitness, something that apparently did not need further theoretical reflection and examination—neither in artistic nor in use-related and socio-spatial respect. We especially detect this implicit reference to the physical enclosing of space in his architectural work from before and during the Bauhaus period when he developed his theoretical positions. That, for him, it nevertheless played a role also at that time indicates for instance the way Gropius used colour as a means of spatial design. As Ulrich Müller (Müller 2004) explains on the basis of his design for the Auerbach house, designed and built in 1924, Gropius used the colouring of the building's interior as a means to deconstruct the present effect of enclosing in order to bring the defined inside spaces into motion. Here his use of colour is oriented towards a moderate decentralisation of the space-enclosing envelope of each separate room. It is a decentralisation that aims at an interplay between the opening and interconnecting elements of doors and windows¹⁵⁴ and that includes an integration of adjacent rooms. This relative positive reference to the aspect of enclosure clearly differs, for instance, from Van Doesburg's idea to completely neutralise enclosed spaces as separated three-dimensional volumes and to transform them into a diverging space dynamics, and, by so doing, to illustrate space, or space-time as such.¹⁵⁵

Nevertheless, the space-forming use of colouring should not distract us from the fact that the the Auerbach house nevertheless shows Gropius's mere implicit reference to architectural space formation. It is an implicit and abstract reference, by which the use-related sizing and positioning of volumes of space takes centre stage in the design of this building and the deliberate attempt to create (a dynamic between) enclosed spatiality and outside orientation by means of the shape and composition of the space defining elements is accordingly not to detect. Instead, this was the assigned function of the colouring. On the one hand, this implicit and rather abstract reference to space formation as use-related volumes of space is consistent with Gropius's approach to (the perception of) space, as analysed in the previous Chapter. On

¹⁵³ Gropius, [1914] 1987, 59.

¹⁵⁴ For a detailed description of the specific use of colour in the design of the Auerbach house, see: Ulrich Müller (2004). *Raum, Bewegung und Zeit im Werk von Walter Gropius und Ludwig Mies Van der Rohe*, 137–165.

¹⁵⁵ See: Chapter 3, 3.2 László Moholy-Nagy and Theo Van Doesburg.

the other side, however, and on what I will focus in this Chapter, it is also strongly related to Gropius's overall approach to architectural design. It is an approach that primarily developed from the very beginning of the twentieth century until the mid-1930s, when he left Germany and emigrated first to England and eventually to the USA. It is an approach that he himself critically reflected after the Second World War, but whose fundamental orientation and underlying motivation remained valid in the later years as well.

The actual subject of this Chapter is to describe this overall approach to architectural design and deduce what kind of (implicit) reference to space formation resulted from it. Here I start with the explanation of this overall approach, which comprises the explanation of Gropius's preoccupation with rationalising building production, his strive for an industrial style in architecture, his demand of synthesising 'artistic design'¹⁵⁶ and industrial production, as well as his specific interpretation of typification in architecture. This approach will be explained as having been dominated by the aim to bring architecture in agreement with the Industrial Age. Next to this, and as it counts for the Neues Bauen as a whole, Gropius's overall approach to architectural design eventually includes a distinct use-oriented concept of design. Its explanation will conclude the discussion of his overall approach to architectural design. The subsequent explanation of the actual reference to space formation begins with the attempt to identify the kind of reference that effectively results from this approach, particularly from his use-oriented concept of design and his view on typification in architecture. Different to the descriptive character of the explanation of his overall approach, this explanation is rather interpretative in nature. This naturally results from the fact that Gropius did not refer to architectural space formation in a direct and explicit way and that this mere implicit reference must be uncovered. What remains however at a rather speculative level, is underpinned and made concrete in the following analysis of Gropius's architectural work. Here, the analysis of his reference to space formation as it becomes manifest in this work is still related to his overall approach, since all the analysed buildings are either directly related to Gropius's use-oriented concept of design or to his attempt to implement the concept of typification in the field of architecture.

¹⁵⁶ Different to my definition in the introduction of how I use in this dissertation the term 'artistic', namely not in terms of art (and corresponding concept of aesthetics) qualifying a particular kind of designing as 'künstlerisch', Gropius use of the term 'artistic' 'does not imply the differentiation between 'artistic' in the sense of 'gestalterisch' and in the sense of 'künstlerisch'. Therefore, in this explanation of Gropius's 'Overall approach to architectural design', I use the term 'artistic design', meaning 'künstlerische Gestaltung', in order to illustrate Gropius's understanding of design in this context.

4.1 The Overall Approach to Architectural Design

Gropius's overall approach to architectural design very well illustrates that the approach of the Neues Bauen was accompanied by a general appreciation of industrialisation as the determining factor of societal reality at that time and correspondingly of (future) architectural production.¹⁵⁷ It was an appreciation that was fed by the fascination for the ongoing developments in the field of industrial production and in infrastructural and urban planning: for the fordistic mass production of goods, for the technification of traffic and communication systems, and its electrification. Gropius's overall approach illustrates this appreciation so well as it comprises the whole range of how industrialisation was linked to architectural design, namely in a production–technical, planning-related, as well as in an 'artistic' respect.

Concerning the production–technical reference to an industrial mode of production, Gropius focused on the standardisation of both building construction and its design from the very beginning of his career in the office of Peter Behrens. Already before the First World War, his preoccupation with architecture, particularly with residential building construction, aimed at furthering the mechanisation and rationalisation of building construction and the production process for the sake of cost reduction. Here, and, as for instance, for Le Corbusier, such production-technical enhancement of both building construction and building process was regarded as a core instrument in solving the urging housing problem. Particularly in the shape of the mechanisation and rationalisation of residential building construction, for the Neues Bauen, industrial production acquired an essential social significance, as expressed in Le Corbusier's famous statement '*building or revolution*'.¹⁵⁸

With regard to Gropius's artistic reference to industrialisation, his preoccupation with standardisation in the field of building production was embedded in the general discourse on the artistic identity of architecture as an applied art in the context of the ongoing process of industrialisation of production. As we know, this discourse is intrinsically tied to the German Werkbund and the discussions held there since its foundation in 1907. Gropius also developed his view as an active member of the

¹⁵⁷ In describing this approach, I explicitly do not go into the so-called expressionistic period of Gropius at the end of the First World War that he shares with Adolf Behne and Bruno Taut during their common work in the Arbeitsrat für Kunst. As Marcel Francisco convincingly points out, the motivation to integrate design and industrial production already characterises Gropius's thinking before the War and also determines his thinking during the Bauhaus period (Francisco, 1971).

¹⁵⁸ Le Corbusier [1923] 2007.

Werkbund and in the particular context of these discussions. Here his view was characterised by his twofold strive for a synthesis between architecture as a building art and the reality of industrial production. He aimed at such a synthesis at the level of form-related design and style, and then, at the level of artistic production.

Towards an architecture of the Industrial Age

Concerning the first way of striving for a synthesis between architecture as a building art, and the reality of industrial production, Gropius conceived industrialisation as the very basis of a new kind of design in architecture—of a new monumentality and style. In his approach he clearly differed from the architects and theorists of the nineteenth century and their efforts to develop a contemporary architectural style.¹⁵⁹ For Gropius, it was not about reconciling architecture with the modern Industrial Age on the basis of architecture's own historical legacy. Rather, he had in mind a unity of Industrial Age and architecture, in which the first would determine the cultural identity of the latter, and thus realises a radical emancipation from that architectural legacy, at least in terms of representing a history of style.¹⁶⁰

Quite specifically, Gropius derived this approach from Alois Riegl's theory of 'Kunstwollen' (artistic volition). The specific aspects of Riegl's theory—it also characterises Gropius's adaptations—is the idea that each era of human development strives for its own kind of art and 'artistic design', which simultaneously expresses the specific mode of '*how we always give shape and colour to things*'. Additionally, '*the character of this is always determined by what may be termed the conception of the world at a given time (again in the widest sense of the term), not only in religion, philosophy, science but also in government and law ...*'¹⁶¹ As Kurt Bardt explains, for Riegl, and accordingly for Gropius as well, 'Kunstwollen' was, in this sense, not the will of the individual artists, but part of an '*all determining will of a community, more concretely, of a given time, of a nation...*'¹⁶² Accordingly, for both, a specific work of art indeed brought, in a particular artistic way, the

¹⁵⁹ Concerning the way, how the nineteenth century Germany theorist discussed this issue, see: Mitchell Schwarzer: *German Architectural Theory and the Search for Modern Identity*.

¹⁶⁰ Correspondingly, his reference to the notion of 'Gesamtkunstwerk' rather aimed at a production-oriented synthesis of the various handicrafts craft and industry than an artistic synthesis of architecture, sculpture, and painting. Also compare the following paragraphs: 'Synthesizing Art and industry' and 'Unity'.

¹⁶¹ Riegl, 1901, 215. Quoted from the English translation, 1985, 231.

¹⁶² Ibid, 231.

artistic volition of an era of expression and yet did not represent in itself its fulfillment.

In one line with his simultaneous engagement with industrial prefabrication and standardisation in residential building construction, Gropius now referred to an industrial mode or relation of production as the all-determining factor of the present. He expressed this as the *'higher idea of work oriented to the modern global economy'*.¹⁶³ Gropius identified industrial production as constituting the *'greatest thought'*¹⁶⁴ of his time. It indeed determined for him—just like for many other protagonists of the Neues Bauen and particularly for Le Corbusier—the ethical relationship between modern man and world.

In contrast to the late nineteenth century, Gropius believed to have discerned in the beginning of the twentieth century the signs of a possible artistic implementation of this higher idea in the field of architecture:

*The ideas of the time are striving for architectural expression, the monumental work demand needs buildings, which would express with solemn pathos the inner value of the facilities, allowing the architectonic characterisation of working methods. Palaces have to be built for labor, which give the factory worker, the slaves of modern industrial work, not solely light, air, and cleanliness, but let him feel something of the dignity of the great common idea that drives the whole thing.*¹⁶⁵

In his approach, he differed from other contemporaneous approaches of developing an architecture of the industrial modern age, such as August Perret, Le Corbusier, or Ludwig Mies van der Rohe, because he did not take a specific industrial mode of construction as the essential point of departure for a new industrial mode of architectural design. Although Gropius was occupied at this time with the standardisation of residential building construction, he cites contemporary industrial buildings as examples for the intended implementation of the 'artistic volition' of the Industrial Age at an architectural level because:

In industrial structures there resides a certain originality and power inside and out. (...) They possess the preconditions for monumentality. Therefore, the assumption seems reasonable that the large buildings of modern industry (...) are becoming by virtue of their totally new formal nature, harbingers of a coming monumental architectural style, which for the time being lacks the necessary ethical or religious basis. (...)

*We are already beginning to sense that a higher culture can blossom from today's view on the world; but then from the expressed forms of our time the expansive ethos of a new sacred style could be born ...*¹⁶⁶

¹⁶³ Gropius, [1911] 1987, 31.

¹⁶⁴ Ibid, 31.

¹⁶⁵ Ibid, 31.

¹⁶⁶ Ibid, 28, 51.

On the one hand, Gropius here particularly refers to North American grain silos as first examples of such a new style, not the nineteenth century steel or glass-steel constructions like the Eiffel tower or the Galerie des Machines. In these monumental structures Gropius saw the presence of that higher idea. On the other side, as Winfried Nerdinger (Nerdinger 1985, 10) points out, Gropius regarded this architecture as the first basis that should be continuously developed in the tradition of classical European architecture. In this sense, for him, the American grain silos represented an architecture whose form-related design (still) was completely determined by technical production and the concept of rationalisation. That ‘new sacred style,’ however, had to bring this pure technic to an architecture–cultural level so that it could transform that pure technical form into an art form.

Interestingly, Gropius did not incorporate here the subject of standardisation, why his examination of industrial architecture remained separated from his preoccupation with production- and construction–technical issues. Instead, already in 1911, the artistic renewal of architecture, for him, was much more aimed at a design of built form that should bring the rationality and efficiency of industrial production and the machine age artistically to expression by means of clear and abstract forms. In this way, he believed to implement a new kind of monumentality in architecture. It is a monumentality, which later determined the architecture of international style, but Gropius already described it in his catalogue entry for the Bauhaus Exhibition of 1923:

*We want to create the clearly organic construction body, naked and radiating from inner laws without lies and trivialities, which affirms our world of machines, wires, and fast vehicles, which out of itself functionally clarifies its meaning and purpose via the tension of the built masses, and that discards anything unnecessary, that obscures the absolute form of a building.*¹⁶⁷

Ten years earlier, he already described this new kind of design as being characterised by the fact that ‘*precisely shaped form, without any randomness, clear contrasts, the structuring of the constituent elements, the sequencing of similar parts and the unity of form and colour will become the aesthetic munition of the modern architect*’.¹⁶⁸

Synthesising ‘artistic design’ and industry

Gropius’s affirmative attitude to industrialisation is made complete by the idea to harmonise the realm of (applied) art with standardised industrial production. With

¹⁶⁷ Gropius, [1923] 1987, 90.

¹⁶⁸ Gropius, [1913] 1987, 56.

this, he believed to bring not only architectural design and other applied arts to the level of industrial modern age, but also to bring industrial production, in turn, to an artistically high level. The key term here is ‘typification’, that is, the development of standard types also in architecture and other applied arts. For Gropius, the designing of types was a fundamental condition for the aimed unity of Industrial Age and the realm of (applied) art. In this sense, it also played a central role in the realisation of an architectural style that heralds the way for the architectural culture of the Industrial Age:

Standardisation is not an impediment to the development of civilisation, but, on the contrary, one of its immediate prerequisites. A standard may be defined as that simplified practical exemplar of anything in general use which embodies a fusion of the best of its anterior forms—a fusion preceded by the elimination of the personal content of their designers and all otherwise ungeneric or non-essential features. Such an impersonal standard is called a ‘norm’, a word derived from a carpenter’s square.

The fear that individuality will be crushed is the sort of myth which cannot sustain the briefest examination. In all great epochs of history the existence of standards—that is the conscious adoption of type-forms—has been the criterion of a polite and well-ordered society; for it is a commonplace that repetition of the same things for the same purposes exercises a settling and civilising influence on men’s minds.

Gropius developed this approach to ‘typification’ by continue developing Hermann Muthesius’s concept of ‘type’, from which he had distanced himself in the so-called Werkbund Streit in 1914. And Gropius indeed differed from Muthesius in the respect that he did not primarily aim at the reformation of industrial production for its own sake, but rather in order to stimulate (applied) arts, as has been pointed out by Walter Claussen.¹⁶⁹

Within this cooperation, according to Gropius, the industry did not only have to provide the most efficient way of production. Additionally, he identified industrial production to deal with the material composition and practical use of the produced products. The artist, in turn, had the (cultural) task to revive the industrial world of pure material–technical production to life as he/she ‘*has the capability to breathe soul into the death product of the machine; his creativity lives on as a living ferment...*’¹⁷⁰

The common dominator that industry and artist (representing civilisation and culture respectively) shared and that accordingly enabled them to unite was, for Gropius, the fact that always ‘*the work of art is also a product of technic,*’ that both sharing the same means of design and that the work of art has ‘*in spiritual as well as physical sense to*

¹⁶⁹ Claussen, 1986, 94.

¹⁷⁰ Gropius, [1916] 1987, 60.

function just as the product of the engineer'.¹⁷¹ In practical terms, certainly concerning architecture, for him, it was handicraft that united 'artistic design' and industry and which therefore had to merge into that new synthesis in the industrial modern age:

*Today handicraft and industry are increasingly converging and must gradually merge into a unity of production, which each individual regives the meaning of working at the whole thing.*¹⁷²

Type and essence

As part of such a synthesis of artistic design and the industrial mode of production by the development of standardised types, Gropius identified the type as embodying the *essence* of respective product or *thing*, as he called it. Here he refers to the essence of 'a thing' as its *use-related* essence, which is intrinsically tied to a specific use-related purpose—for instance, the purpose of a chair to provide a place to sit on. In this sense, for Gropius:

*a thing is determined by its essence. In order to design it, so that it functions correctly – a container, a chair, a house – first, its essence must be explored, because it should perfectly serve its purpose, i.e. practically fulfill its function, be durable, cheap and 'beautiful'.*¹⁷³

According to Ute Poerschke,¹⁷⁴ Gropius referred to the essence of 'a thing' in an explicit *functional* sense—this means that the essence of a thing comprises the functional *relations* of that thing to other things. Although Poerschke too easily replaces, in my opinion, purpose by function, her differentiation between both terms helps to explain in a better way what Gropius had in mind when he referred to the term 'essence': It is the (use-related, constructional or other) *purpose* of a particular 'thing', which simultaneously stands in a *functional* relation with other things as soon as we refer to that purpose in a larger context.¹⁷⁵ In this sense, the essence of a chair to provide a comfortable place to sit on is conceived in the context with other chairs and a table, and in a specific room and even in the context of industrial modern age. Concerning the aimed synthesis of artistic design and the industrial mode of production, for Gropius, the assigned quality of a type to represent the use-related essence

¹⁷¹ Gropius, [1926] 1987, 102.

¹⁷² Gropius, ...

¹⁷³ Gropius, [1925] 1987, 93.

¹⁷⁴ Poerschke, 2005, 172.

¹⁷⁵ However, Gropius himself did not consequently use the term purpose and function where one another complements the meaning. This becomes evident, for instance, in the quote cited below in the paragraph: 'Desining use', page 96.

of a thing (whether a chair or a whole building) now fills this synthesis with a social content and correspondingly links it with practical life and social reality.

At the same time, for him, the idea of producing products in complete harmony with their use-related essence did not exclude any variation of types. Gropius indeed claimed—for instance, with regard to the production of dwellings—that also ‘*the human dwelling is a matter of mass production*’ and that ‘*the majority of citizens has uniform dwelling and living needs*’.¹⁷⁶ At the same time, however, he just claimed that there would be enough flexibility to please individual needs within the system of standardisation. Concerning residential building production, he correspondingly suggested to unite standardisation and individual demand by means of limiting typification to that of building components and to maintain, in this way, the possibility of artistic variation. As a result, for him, individual needs could be fulfilled, whereas the ‘*standardisation of building elements will have the beneficial effect that the new houses and quarters will have a common character*’.¹⁷⁷ In this sense, he saw a central task of the Bauhaus in:

*... creating an experiment centre that aims at uniformly assembling for residential construction all the achievements of commerce, technology and forming conjunction with the work of technicians, businessman, and artists. The aim of this work lies in the implementation of the demand for maximum typification and the greatest possible variability of residential buildings. The solution of the main problem must be sought in the typification of building components, and in assembling the various residential organisms together, in other words creating a ‘Baukasten im Großen’ (large-scale construction set) from new technical and new spatial conditions, out of which various residential machines can be constructed in accordance with the given headcount and the needs of residents.*¹⁷⁸

Gropius basically referred to variation in the sense of variation in the building’s spatial configuration. This implied variation in terms of use, as a different space was conceived to be based on and to enable different kinds of use. In relation to a specific type, however, he did *not* address use as a subject of variation. One type, one kind of use. Other protagonists of the Neues Bauen, such as Mies van der Rohe and Le Corbusier as well as Adolf Rading¹⁷⁹ and many others, occupied them very well with the space-forming shape to enable a variation in use. For all of them, the main object of standardisation was the construction principle: for Le Corbusier, it was the reinforced concrete frame principle, while it was skeletal steel construction for the other

¹⁷⁶ Gropius, [1925] 1987, 98.

¹⁷⁷ Ibid, 98.

¹⁷⁸ Gropius, [1923] 1987, 91.

¹⁷⁹ As for instance, Rading’s design of a residential highrise building for the Werkbundaussstellung in Breslau, 1929, was based on a steel construction system that he developed, according to Kurt Junghans, together with Hans Scharoun already in 1926.

two. The target of a variation in layout was believed to have been realised just by reducing the bearing construction to a minimum; a variation that, at least potentially, also had to enable a variation in terms of use.

Unity

Gropius aim of synthesising artistic design and industry and of stimulating applied arts by linking ‘typification’ with the notion that a ‘type’ was complemented by his fundamental strive for realising a universal unity in artistic design. This is a unity conceived as universal as it should comprise ‘*all things and phenomena*’¹⁸⁰ of (human) reality. In this sense, he conceived it as an essential constituent in the realisation of a new mental concept—a new spiritual image of the world. In the foreword to Gilbert Herbert’s book *The synthetic Vision of Walter Gropius*, he accordingly explained in 1959 that ‘*all my various endeavors can be understood only, when seen as a concerted effort to promote unity in diversity in art, architecture and planning*’.¹⁸¹ Gropius continues:

*During the early years at the Bauhaus (...) I formulated it this way: The will to develop a spiritual image of our world, characteristic of our time, an image which would have universal validity, implies an effort to free spiritual values from their individual limitations in order to obtain objective standards of value. An intellectual common dominator is needed which would give totality of aspect priority to any specific attainment.*¹⁸²

Just the applied arts, in particular architecture, Gropius assigned the task to develop that ‘spiritual image of our world’. To reach this goal, he demanded from the designer a certain objective perspective in order to overcome his/her own artistic ego and to free, by so doing, the creative practice of design from the inherit academic fragmentation and disconnection with human life.

For Gropius, this artistic unity was an ethic issue, a fundamental condition that is intrinsically tied to the industrial modern age and the aimed unity of the modern age and artistic design. Here, for him, human life naturally belonged to its societal conditionality and its socio-cultural and socio-economic context, which he, consequently and as a matter of principle, conceived as one coherent entity. Accordingly, for him that ‘spiritual image’ contained the awareness that one’s own creative work is deter

¹⁸⁰ Gropius, [1923] 1987, 83.

¹⁸¹ Herbert, 1959, vii.

¹⁸² Ibid, vii.

mined by the socio-cultural and socio-economical context within which it is conducted.¹⁸³

In-between conclusion

Thus far, we may conclude that Gropius's overall approach to architectural design comprises two kinds of integration. First, there is a three-part integration of architectural design and Industrial Age: at production–technical, form–aesthetical, and artistic–productive levels. Concerning the first and the latter, 'type' and 'typification' represent the central elements and embody this integration including the integration of handicraft. Second, there is an all-embracing approach to applied arts and artistic design including architectural design and planning. Together, both kinds of integration result in the concept of a new kind of 'Gesamtkunstwerk,' uniting all applied arts on the basis of, and in mutual relation with, the reality of contemporary society, of the modern world. The last element that completes this mutual integration of architectural design and Industrial Age and -production is the linking of the notion of 'essence', of the use-related essence of a 'thing', with the design of 'life processes', of use-related activity, and on which I will enlarge in the following paragraph.

Designing use

Next to the hitherto explained parts of Gropius's overall approach to architectural design, describing the specificity of his approach, Gropius shared with the other pro

¹⁸³ The demand for conceiving artistic production in its socio-cultural dimension links Gropius to William Morris, since for Morris, as Nikolaus Pevsner puts it, the point of departure 'is the social condition of art which he saw around him'. Accordingly, he 'removes the problem from aesthetics into the wider field of social science'. At the same time, Pevsner points out that 'Morris's notion of art derives from his knowledge of medieval condition of work, and is part and parcel of nineteenth century "historicism"'. Preceding from Gothic handicraft, so Pevsner, Morris defined art simply as 'the expression by man of his pleasure in labor', as to be made 'by the people and for the people, as a happiness the maker and the user'. As a result of his corresponding categorical rejection of machine production, the fundamental difference between Gropius and Morris was the different kind of connection they make between industrialisation and the emancipation of artistic production from the inherited academic tradition. With his concept of synthesizing (applied) art and industry by a simultaneous integration of handicraft, Gropius can be regarded, however, as someone who has transformed Morris's approach at the level of industrial production.

tagonists of the Neues Bauen the focus on use and the use-related meaning of architecture as the essence of architectural design.¹⁸⁴ Just by the ‘backbonding’ of architectural design with practical use in and of space, the new design and (form-related) aesthetics was believed to be grounded —expressed by Adolf Behne in his programmatic claim: ‘*No longer designed space - but designed reality*’.¹⁸⁵ Also for Gropius, it was the linking of (form-related) design with use that should emancipate architectural design from the traditional (also form-oriented) aesthetics of the nineteenth century.

However, the focus on use and the use-related function as the very essence of architectural design was to be found in the art–scientific discourse, too. Here it was in particular Paul Frankl who advanced this view, arguing that the essential artistic meaning of architectural design or rather space formation would be, as explained before, to form the *stage* for the use-related activities (related to the ‘purposive intention’ of a particular building), and to enable, by so doing, their realisation. As an art historian, Frankl approached such ‘functional backbonding’ of architectural design from an aesthetic and perception-oriented perspective. Accordingly, he referred to that ‘purposive intention’ as an artistic content, which gets artistically expressed in and is perceptible via the ‘spatial form’ (Raumform) of a building. Different to Frankl, the Neues Bauen now addressed the functional relation between use and architectural design in a second respect: The use-related function of architectural design was conceived to be significant not only as an essential artistic content of design, but also as its fundamental purpose. From this followed, however, a further subordination of design to use, although Frankl's idea of an artistic expression of the use-related purpose of a building in its material-spatial appearance remained. The latter is also apparent in the following quotation from Gropius. First of all, however, this quote indicates that further subordination of design to use:

*Construction means providing form for life processes. The organism of a house is derived from the sequence of events that take place in it. In a residence these are the functions of living, sleeping, bathing, cooking, eating, which necessarily give the whole design of the house its form. In railway stations, factories, and churches the processes are different, but it is out of them alone that the true form results. Building design is not for its own sake; it arises solely from the nature of the building, from the function it is meant to fulfil.*¹⁸⁶

Conceiving, in this sense, a building spatially organising use-related activity, Gropius refers to architectural design as a practical tool of such organisation. In combination

¹⁸⁴ Compare: Chapter 1, Neues Bauen and Team 10

¹⁸⁵ Behne, [1926] 1964, 40.

¹⁸⁶ Gropius, [1927] 1987, 114.

with the aforementioned demand to design in accordance with the (use-related) essence of a thing, it is the design of life processes that he regards as that essence or, as formulated above, *'the nature of the building ... the function it is meant to fulfil'*.

Next to the ambition to design, in this vein, the use or life processes itself, within the Neues Bauen, use and its organisation (and the corresponding purposive meaning of architectural design) was conceived in a broader sense. As pointed out in Chapter 1, the concept of use was no longer restricted to immediate use-related activity in and of defined spaces. Instead, it included, to a certain extent, the societal dimension of use and activity including their economic conditionality. With regard to dwelling, Gropius argued in this sense that *'whoever looks deeper must be interested in the question of (...) how the architect must solve the problem of dwelling – living, sleeping, cooking, eating, bathing – from the social, economic, and overall organisational point of view'*.¹⁸⁷ This orientation towards the societal and socio-economic dimension of use implied, however, a corresponding concept of human life and social identity. This was a concept that necessarily did not imply the immediate socio-spatial identity of the individual human subject. Instead, for Gropius, the individual human subject was, as Karin Wilhelm points out: *'First and foremost (...) defined in its social being and, as such, determined by the dominant social force of industry'*.¹⁸⁸ Interestingly, this orientation towards the societal and socio-economic dimension of use complements the view to conceive a building as a unit for organised use rather than something that provides shelter and a private realm of living.

4.2 From Overall Approach to Architectural Work: Gropius's (Implicit) Reference to Architectural Space Formation

Gropius's overall approach to architectural design implies a production- and a use-related reference to space formation. This reference is not explicitly stated, although it implicitly results from this approach. The fact that it can be identified is based, in turn, on the fact that space formation forms - as a matter of principle - an intrinsic and basic part of architectural design. Since they are not explicitly stated, however, their identification is rather interpretative in nature, as mentioned before.

Starting with the use-oriented reference to space formation, this reference coincides with the already explained approach to architectural design that also refers to

¹⁸⁷ Gropius, [1927] 1987, 116.

¹⁸⁸ Wilhelm, 1983, 38.

architectural space formation—be it in terms of the enclosing, the opening, or the arrangement of spaces—as a practical tool in the designing thus spatial organisation of use itself. As part of this approach, the socio-spatial meaning of space formation—to create protection and privacy by means of shaping enclosed spaces—does not seem to have played a particular role (also) in Gropius's view,¹⁸⁹ although the aforementioned quote that *'the artistic genius finds ways and means to create the feeling of security, even with the bodiless materials as glass and iron'*¹⁹⁰ indicates his awareness for this meaning. Yet, such considerations remained isolated statements and did not lead to a further artistic examination of space formation in itself. Instead, he indeed seems to have conceived the defining of spaces primarily in terms of separating different use-related activities in space. The associated focus on the spatial arranging of rooms makes sense, since it is indeed the essential space-forming tool in the architecture-spatial organisation of use and use-related activity.

As a result, and in line with his approach to (the perception of) space, a clear notion of architectural space as enclosed spatiality is not to be detected in Gropius's approach to architectural design. The neglect of the socio-spatial meaning of the enclosing of space and the creation of enclosed spatiality, and the corresponding emphasis on the practical arrangement of spaces, gets strengthened, in turn, by a primarily technical dealing with the opening and the interconnecting of rooms. Gropius just as little conceived the opening and relating of defined spaces in an immediate socio-spatial sense, that is, in the sense of connecting and relating rooms of same or different socio-spatial quality to one another. Instead, he referred to both as a practical design tool in the organisation of use and corresponding activity. With regard to windows, it is the corresponding technical function of bringing air and light in that room that takes centre stage. In one text, Gropius even combines this quality with the simultaneous aim of optimising the spatial size of the dwelling, arguing that *'man, by providing the best standards of ventilation and illumination, only needs a small portion of living space, especially if this space is operationally well organised'*.¹⁹¹

¹⁸⁹ This view, of courses, characterised the Neues Bauen in general. It also characterised Frankl's approach: compare: second Chapter, page ...

¹⁹⁰ Gropius, [1914] 1987, 59.

¹⁹¹ Gropius, [1929] 1987, 134. It was Gropius's Bauhaus colleague Siegfried Ebeling, who went a step further. He not only referred to space formation, and its use-related purposiveness, in terms of sizing but directly touched on the aspect of enclosing and separation. Referring to space first and foremost in terms of electromagnetic radiation, he now referred to the space-enclosing shape as a mediating element between that radiation and the occupant, living inside that shape. The main purpose of the space-enclosing form accordingly was to realise a comfortable atmosphere by protecting the occupant from the *'innumerable measurable (or as yet immeasurable) minute flows stemming from the breathing earth or the radiating space of the sky ... from being exposed to the detrimental effects of subtle*

With regard to the production-related reference to space formation, it is the demand of typification in residential building construction that includes a, again rather limited, reference to architectural space formation. Here, and as will be illustrated below on the basis of his conception of 'Wabenbau' and 'Baukasten im Großen' as well as various housing projects, next to the production–technical standardisation of space-forming elements, Gropius's implementation of the concept of 'typification' in residential building construction mainly aims at the standardisation of rooms in terms of their sizing and arrangement according to their use-related function. In this sense, the production-related reference to space formation essentially refers to space formation as a practical tool in the designing of use, that is, in the standardised designing of standardised use. Therefore, in the context of a typification in residential building construction, Gropius's reference to space formation implies at least a clear superimposition, if not substantial neglect, of the immediate socio-spatial meaning of separating and enclosing spaces, of opening and relating spaces, of creating enclosed spatiality and outside-orientation, and the mere practical emphasis on the moment of spatial arrangement.

Building Analysis

The following analysis of different buildings, all designed from the early nineteen-twenties on,¹⁹² now deals with the question, which effective use of space formation

atmospheric fluctuations (such as thunderstorms, blizzards, or the Foehn or Sirocco winds' (Ebeling, [1926] 2010, 8). At the same time, the necessary amount of light and air was to be brought inside by means of a technically sophisticated illumination and ventilation. He conceived this inside as the mediating element between the occupants and the cosmos, by which they should be able to '*develop in complete autonomy, free from all external influences, into a self-contained being-for-oneseelf (Fürsichsein) – a micro cosmos*'. (Ebeling, [1926] 2010, 10–11.) With this, Ebeling assigned a direct influence of technical perfection and mechanisation on the socio-spatial quality of the built spaces. Correspondingly, his so-called *all-metal circular house*, which he developed as a prototype, was determined by the wish to create a complete inside orientation and was thus round in shape. Regarding the socio-spatial function of space formation to provide protection and a private realm of living, we see how Ebeling conceived the quality of privateness as getting entirely generated by technical means. In this respect, his approach clearly includes a mechanisation of space formation, that is, the mechanisation of an essential part of its socio-spatial meaning. In so doing, he anticipated the so-called capsule architecture (De Cauter, 2001, 751–53.), developed after the Second World War by Peter Cook and others.

¹⁹² Though Gropius design method was characterised by an intense exchange with the by him employed architects (and why he has been repeatedly criticised as not having developed an own consistent style), he always defined – as also Winfried Nerdinger points out (Nerdinger, 1985, 29-

is to be found in his architecture. To what extent this use corresponds with the (implicit) reference as it results from his overall approach to architectural design, to what extent it differs. Accordingly, this analysis focuses on the 'space-forming structure' and the corresponding kind of interplay of the spatial arrangement, the separating and enclosing, and the opening and relating of spaces, as is it to be found in various buildings and designs.¹⁹³ Here each analysis distinguishes, and accordingly comprises, three layers. First, there is (the analysis of) the overall configuration of inside and outside spaces and of their pure spatial arrangement. Also, there is the way as to how the various inside-spaces are formed and related to one another along with how they are sized, separated from, and connected with one another. Further, there is the way as to how the inside-out relation between the buildings' inside and the surrounding outside is concretely shaped.

Next to analysing, in this vein, the space-forming structure of various building designs, the whole analysis is subdivided into two main parts. In the first part, the intention is to analyse and evaluate on the basis of several educational buildings the kind of space formation as resulting from the implementation of the design-approach to design use itself. Although this approach naturally also found its implementation in the residential buildings that are analysed in the following part, the selected educational buildings are more suitable cases for this part, owing to the higher complexity of the underlying programme. Next to this, particularly on the basis of various educational buildings, a particular change in Gropius's (implicit) reference to space formation may be illustrated: the growing application of the enclosing of outside spaces from the mid-1930s onward.

In the second part, the intention is to analyse and evaluate the kind of space formation as it appears in combination with the implementation of the concept of typification in residential building construction.¹⁹⁴ Since this typification essentially aimed at a use-oriented sizing and arrangement of rooms according to their use-related function, this part also implies the analysis and evaluation of the kind of space formation as it results from the implementation of the design-approach to design use itself, but now in combination with the moment of its typification and the resulting standardised repetition of the formed spatial relations. Another essential difference with the first part is the different socio-spatial character of educational and residential

32.) - the basic features of a design. Since to these basic features particularly belongs the overall configuration of a building, in the analysis of the specific kind of space formation of the various projects, I therefore refer to Gropius as their main author.

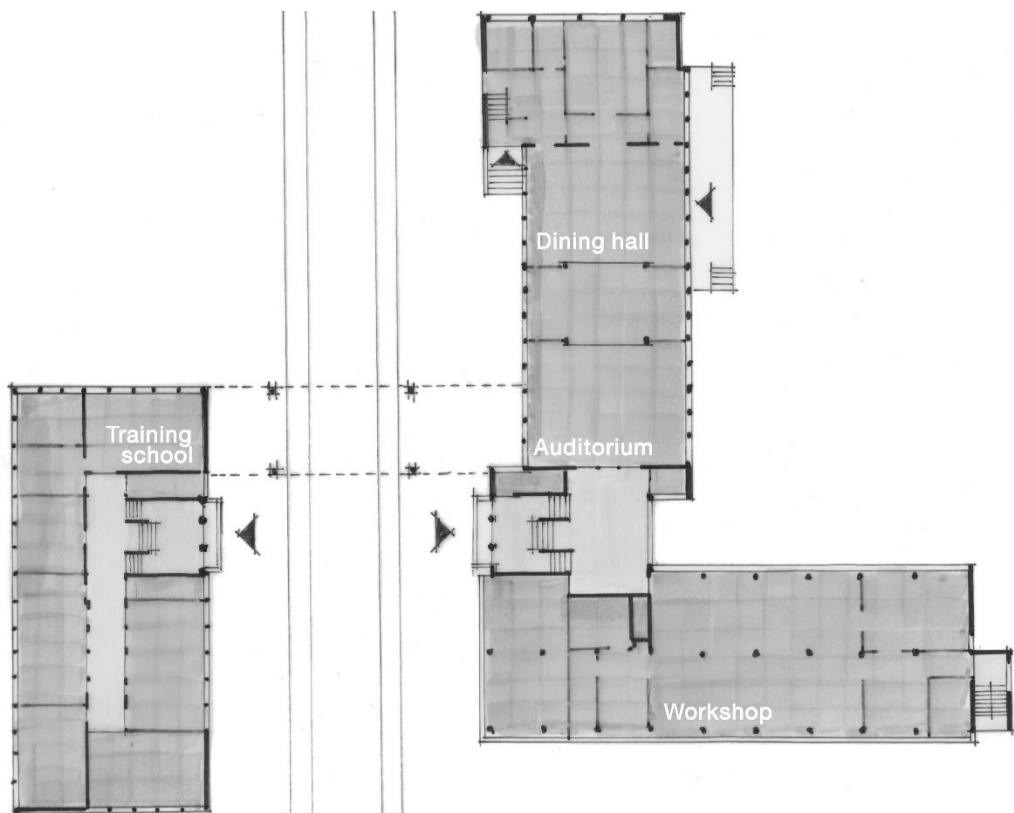
¹⁹³ Concerning my definition of that interplay and the concept 'space-forming structure' compare: Chapter 1, The interplay of enclosing, opening and arranging spaces.

¹⁹⁴ Owing to this intention, all designs for individual houses are left aside here.



1 Bauhaus Dessau, aerial view from the south

2 Bauhaus Dessau, ground floor



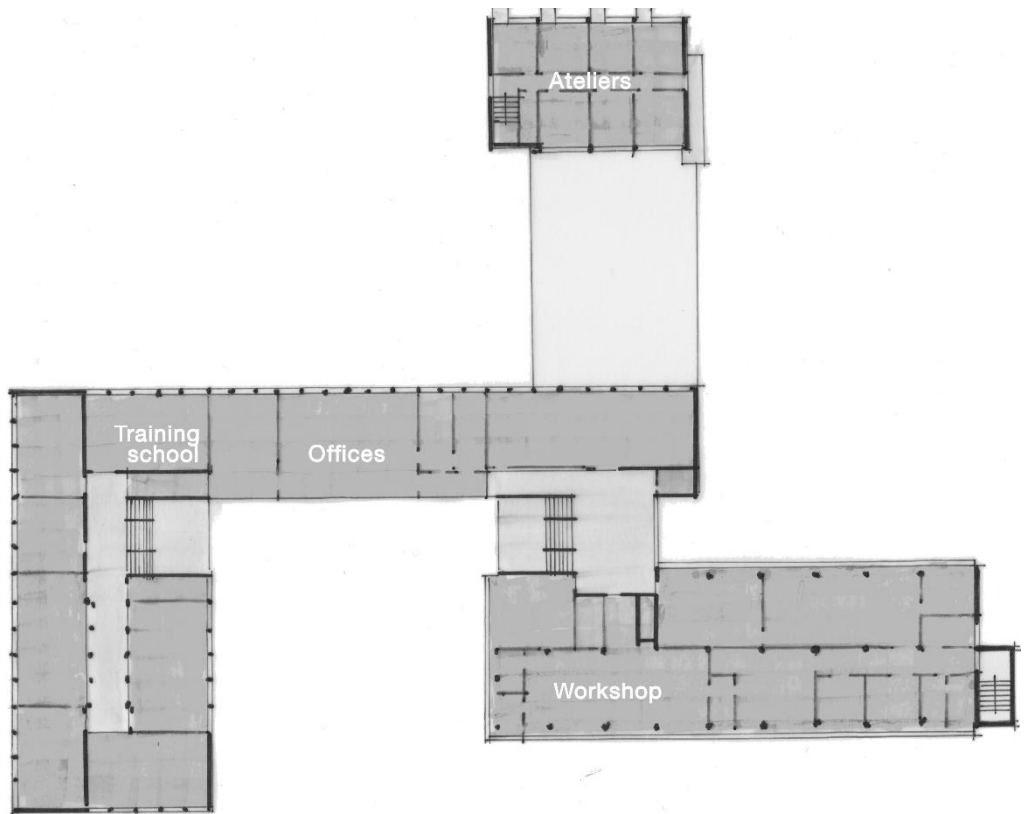
buildings: the clear opposition between private and public realm that distinguishes the latter from the first. Since almost all discussed housing projects are linear developments along a street, the aspect of enclosing thus spatial enclosure plays a minor role here. Instead, the analysis and evaluation of the inside-out relation between dwelling and street takes centre stage. At the same time, this second part represents a specification of the (use-oriented) examination of the various educational buildings. Therefore, the discussion of the latter stands at the beginning of the exemplification of Gropius's reference to space formation as it becomes manifest in his architecture.

4.2.1 From Bauhaus Dessau to Harvard Graduate Centre: Architectural Space Formation in the Context of 'Designing Use'

Bauhaus Dessau

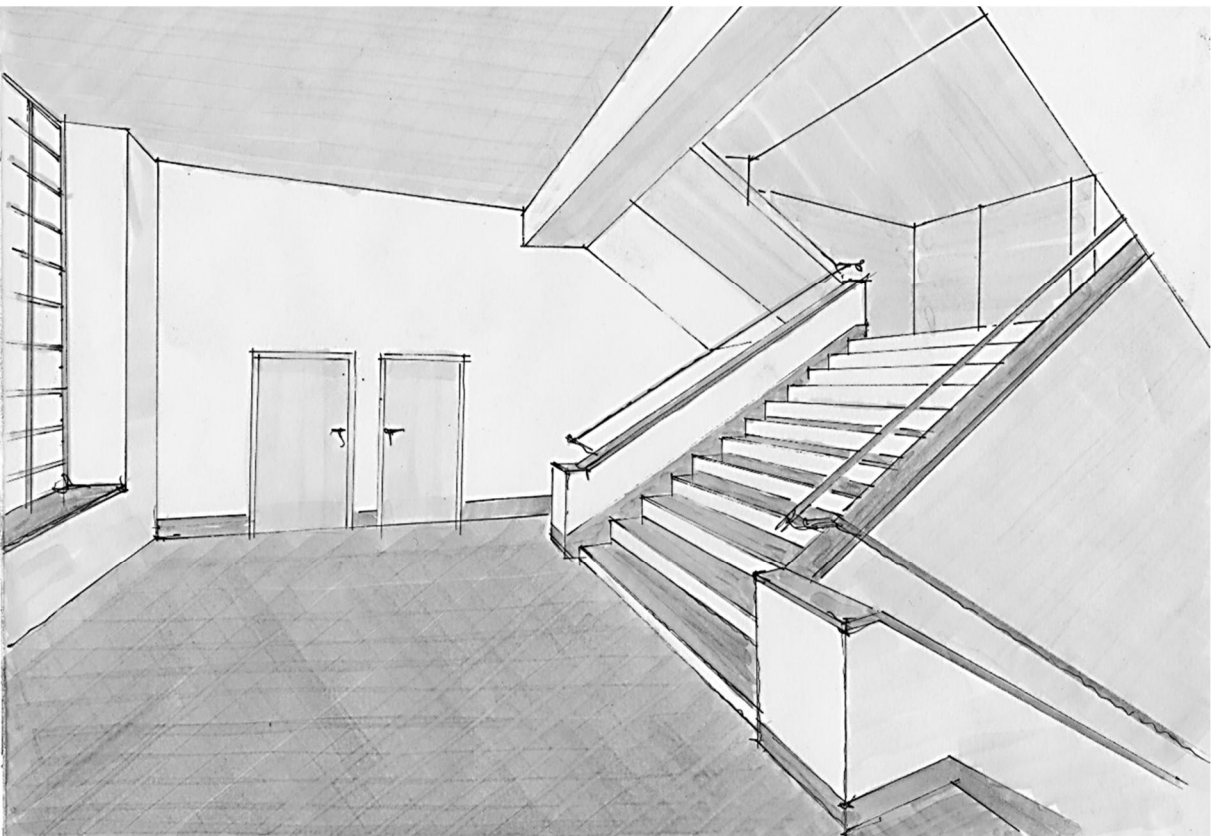
The Bauhaus building in Dessau, completed in 1926, was Gropius's first educational building. He was commissioned with its design by the municipality of Dessau, since the school had to leave Weimar due to political and resultant financial reasons. The decision to move to Dessau, however, provided Gropius the opportunity to implement his approach to architectural design in a comprehensive way.

In its space-forming structure, the building is first characterised by an overall spatial configuration that is composed by five clearly distinguished building sections, arranged in the overall shape of three building-wings, diverging into north, south, and east directions (Figs. 1–3). The south wing includes the main entrance to the actual Bauhaus school and the workshop section, both four-storey buildings. The north wing, which is of the same height, accommodates a separate training school (with its own entrance opposite to the entrance of the Bauhaus school) and the office section that connects both schools in the shape of a two-storey bridge. The east wing incorporates a two-storey section with the auditorium and dining hall; its adjacent vertical atelier-building contains six storeys. All sections are rectangular and longish volumes with a correspondent internal orientation and circulation. From section to section this orientation shifts with 90 degrees, including the vertical orientation of the atelier building. Such configuration enables a maximum of spatial-independence and outside orientation for all rooms. The spatial centre where the three wings come together and from which they orthogonally diverge in different directions is the central staircase of the actual Bauhaus building with a separate vestibule at each level.



3 Bauhaus Dessau, 2nd floor

4 Bauhaus Dessau, vestibule



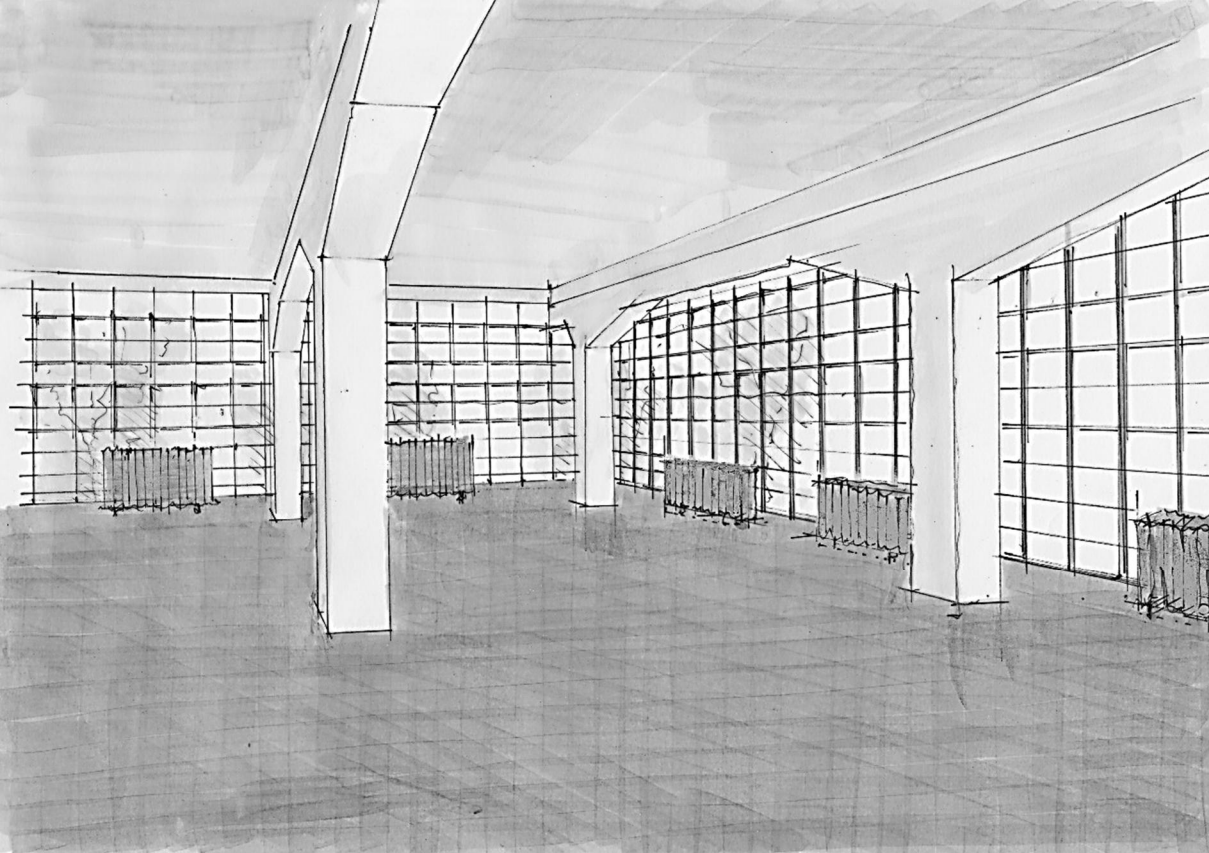
This vertically organised entrance hall is the very heart of the whole complex, including the separately positioned training school. It is the centre of the internal circulation from which all working and study rooms are accessible.

From the diverging spatial orientation of the various sections and rooms results a fundamental disintegration of the building as a self-contained space-forming entity. Zooming into the concrete level of the building's interior design, this disintegration is strengthened by the sizing and the decentral positioning of the vertically organised entrance hall (Fig. 4). In its horizontal extension, it is reduced to a minimum, measuring at each level about 40 m² only. The character of disintegration finds its continuation in a strict physical separation between the various rooms in relation to one another and to the different vestibules. The rooms and sections are arranged and related to one another in a use-related way, only. In fact, with regard to their spatial orientation to the respective immediate surroundings, the various separated rooms are related to the outside but not to one other. As a result, in its overall space-forming structure the building represents a structure of rooms and sections, all of them positioned *next to* one another. Only the two staircases of the actual Bauhaus and the training school with adjacent vestibules are related to each other by means of their opposed positioning and the connecting bridge in between. Furthermore, in this spatial relation both are oriented to, and thus arranged around, the only enclosed and thus defined outside space.

Next to this, the building's design shows an extent of deconstruction of the presence and effect of spatial enclosing that was quite unusual for Gropius.¹⁹⁵ This deconstruction is based on a corresponding differentiation, and resultant separation between the bearing structure and the enclosing shape. Furthermore, it is based on the creation of a more or less extensive degree of outside orientation, generated by a corresponding percentage of window surface. In the most extensive way, this deconstruction is realised in the workshop section, where the bearing structure of columns and beams of reinforced concrete is molded to one coherent and massive three-dimensional structure; it is enclosed by a completely glazed façade (Fig. 5). The different resultant grade of outside orientation, changing per section, strengthens the disintegration of the building as a self-contained space-forming entity.

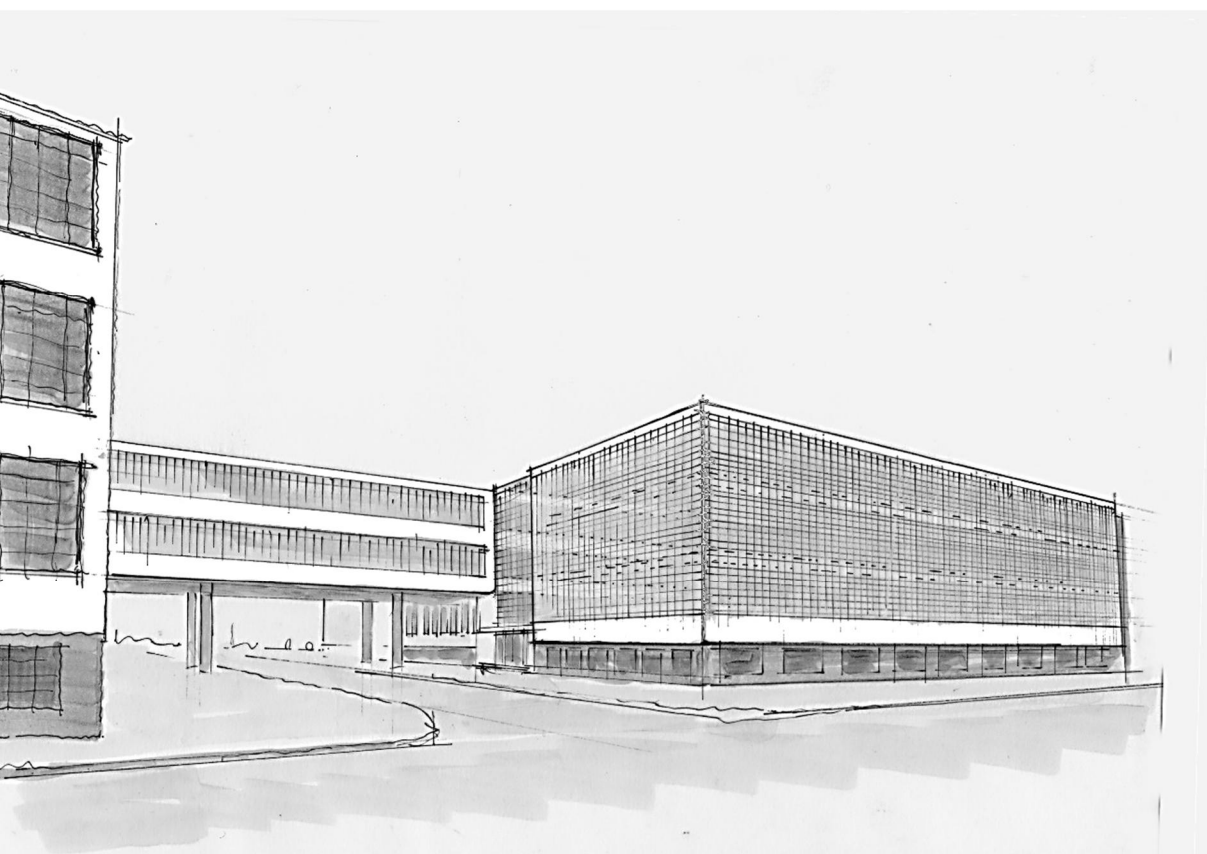
The section with the workshops differs the most from all other rooms and sections: it completely opens up to the outside at three sides and by integrating the different floors in one continuous façade, thereby evoking the impression of one to the outside-open volume (Fig 6). In this vein, and despite its decentral position, the

¹⁹⁵ Until the design of the Bauhaus building, Gropius explicitly used colour as an instrument of deconstructing the static character of enclosed rooms and did so in a quite careful way. Also compare: beginning of this Chapter.



5 Bauhaus Dessau, workshop

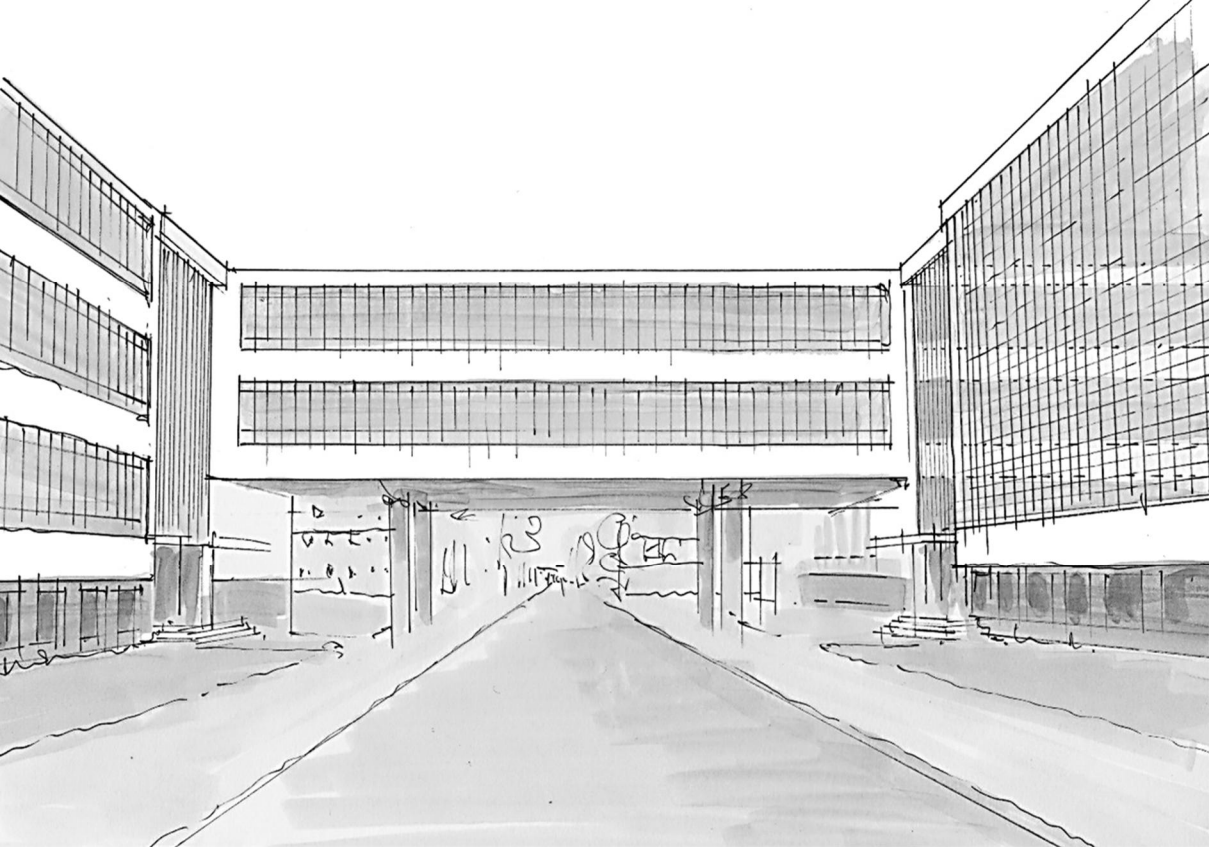
6 Bauhaus Dessau, view from the west



workshop section represents itself as the main part of the whole complex. The differentiation from all other sections is enhanced by the fact that under this volume the pedestal-zone steps back. However, the extensive opening of the workshop section seems not primarily be determined by the intended use and the need to bring as much natural light in as possible. Therefore, a ribbon window, as it appears in different variations in the other sections, would have provided the same result. Perhaps it was intended by the aim to create as much as possible orientation of the workshop rooms towards the outside. In any case, it seems to have been determined by the intention to create a show window, which would show the core activity of the Bauhaus and present it to the outside. Here it simultaneously represents a visual manifestation of Gropius's concept of space as number and motion: a synthesis between a defined volume of space and the designed impression of motion in and of space along with the motion of the inside volume towards the surrounding outside.¹⁹⁶ However, the façade does not create an immediate socio-spatial relation between inside and outside. Rather it brings to expression the societal relation or conditionality of the use taking place at the inside, both for the one who studies and works inside and the one who stays at or walks along the outside and looks from there towards the inside. And it does so with the simultaneous attempt to visualise space in itself.

At the same time, the disintegration of the building as a coherent space-forming entity gets counteracted. First, it gets counteracted at a form-related level of design, namely by the building's coherent materialisation, comprising a continuous grey pedestal and a uniform façade architecture dominated by white plaster and a small variation of steel windows. Second, it gets counteracted at a space-forming level, namely by the existence of the courtyard-like space between the two main entrances of the complex, conjointly created by the north and the south wing. Since they have the same roof height, both wings form a continuous ensemble, separately from the east wing with the much lower auditorium and dining hall, and the attached higher and vertically oriented atelier-building. This only defined outside space is surrounded by the front end of the workshop section, the opposed lying classrooms of the training school and the 'office bridge' that connects the two schools. On the one hand, this courtyard-like space represents the spatial balance point of the whole complex, strengthened by the mirrored positioning of the two main entrances. And in combination with the overall windmill-like configuration, this could create a particular space-forming dynamics between the two diverging building wings and this central

¹⁹⁶ Here the kind of created transparency is, as already Colin Rowe and Robert Slutzky (Rowe and Slutzky 1964) already concluded, a direct immediate transparency between inside and outside; there is no layered quality about it.



7 Bauhaus Dessau, street view main entrance

8 Bauhaus Dessau, view from bridge onto adjacent housing



courtyard, where the building find its spatial centre. On the other hand, however, this dynamics and the effect of counteracting that effect of disintegration get weakened by the fact that this space actually is not a yard but the end of a street: It is a street that comes from the east, runs under the bridge, and between both schools, and ends—with a green on both sides—into the perpendicular street that runs along the complete glazed facade of the workshops section (fig. 7). The ground floor facades, continuing under the 'office bridge, have almost the same height as the bridge itself, enhancing the impression of two opposite buildings at either side of a continuing street. This would also be the impression of one residing at the inside, be it by standing in one of the staircases, in the hallway of the bridge, or in a workshop room. As a result, the only physically defined outside space that gives the whole complex a spatial centre and a space-forming unity represents a passage rather than a courtyard—it is a space of motion rather than one of rest. As the vestibule is a vertical passage, the courtyard-like space is a horizontal one. It seems as if this quality of an enclosed spatiality at this particular location had even developed accidentally as a result of the bridge that connects the training school with the Bauhaus and also because of a building's shape that expresses motion through its meandering shape. This also suggests the kind of space formation that determines the entire interior design. Also here, the deliberate creation of spatial enclosure cannot be detected. Rooms or rather volumes of space are separated, not enclosed. As a result, this courtyard-like space indeed exemplifies Gropius's fundamental concept of space as number and motion and as a synthesis between the shaping of defined volumes of space and the creation of (the illusion of) motion of space. What is more, with the combination of spatial and use-related motion, as well as of spatial opening and street, this space additionally exemplifies how this concept of space perfectly corresponds to Gropius's use- and activity-oriented focus on architectural space.

Another aspect that makes this courtyard-like space the core element of the overall spatial configuration of the building complex is that the street network here penetrates the whole building and that both building complex and the street network intersect with each other. With the courtyard-like space, the Bauhaus building indeed encloses the public space and the public space intersects the building. What is more, this intersection is positioned at the centre of the whole building complex or close to that centre. However, inside and outside do not really meet; they cross each other at different levels. Furthermore, the courtyard cannot function as a real entrance space at ground floor level, since it basically represents the street. Therefore, and despite the integrating aspects, the courtyard-like space eventually does not prevent a clear spatial dualism between the Bauhaus building and the surrounding (public)

space, and as it results from the building's overall windmill-like configuration. Furthermore, the disintegration and the integration take place at two different levels of design, with the latter taking place not at a space-forming level but a pure use-related level.

At the same time, however, and showing again the (space-forming) contradiction of the Bauhaus building, the openness of this configuration provides the possibility to continue developing it into a larger building structure that would very well imply a shaped spatial interconnection between the building and its surroundings. Here, the two corners, defined by the three wings, potentially function as the first definition of the defined outside spaces between the Bauhaus and future adjacent building structure. The same goes for the courtyard-like space between the two main entrances. Despite the disintegrating effect of the street, this defined outside space indeed functioned as a starting point for a further developed space-forming structure: The residential buildings at the opposite side of the street have taken up its limitation on the north side, by which at least a rudimentary relation between Bauhaus and residential building has been created (Fig. 8).

To finally come to the immediate inside-out relations between the various inside spaces and the surrounding outside, the way in which these spatial relations are shaped complements the present overall configuration in its effect of creating a clear spatial dualism between the Bauhaus building and the surrounding outside space. This additional separation basically results from the presence of a continuous base, different in colour and half-a-storey high, and above which the actual inside is raised. Although the windows in this base open the inside to the outside at all building sides, they provide only insights into the secondary rooms in the basement. With regard to all building sides, the only direct inside-out connection therefore are the two opposed lying main entrances of the Bauhaus school and the associated training school.

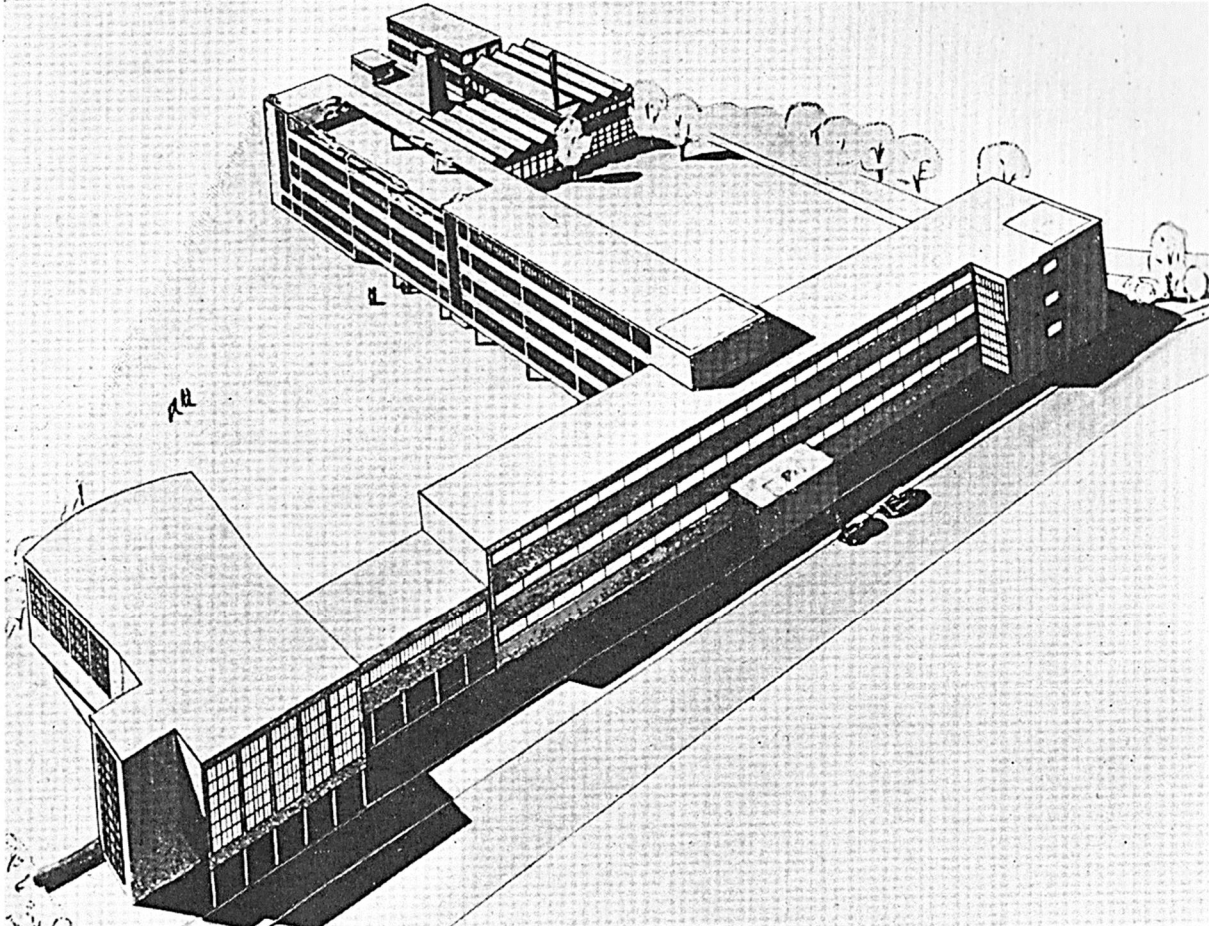
On the garden side of the Bauhaus school, where one may expect a closer connection between inside and outside, such connection is limited to the exit of the dining hall that leads to an elevated terrace and from which a stair leads to the green. From all sides, the building seems to be elevated from the ground and connected with the outside mainly in a visual way and at a number of selected access points. Interestingly, it is the atelier-building where an inside-out relation is explicitly designed in the shape of overhanging balcony constructions. These balconies represent the only inside-out spaces that the Bauhaus building includes, although, and owing to their elevated position, such spaces counteract the fundamental dualism between inside and outside in a rather marginal way.

The explicit interplay between 'enclosed spatiality' and 'outside orientation'

In the various designs of educational buildings that followed, Gropius continued to develop the principle of an overall building's configuration that is characterised by a linear arrangement of the different rooms in rather longish and clearly distinguished sections and diverging wings. In different ways, we find this principle implemented in the competition design for the School for Mechanical Engineering in Hagen from 1929 (Fig.9), the one for the Training School in Berlin Köpenick from 1930 (Fig.10), for the School for Children with Tuberculosis in Papworth Cambridgeshire from 1935–37 (Fig.11), and for the Wheaton College Art Centre in Wheaton (Mass.) from 1937 (Fig.12). Next to this, it also characterises three realised designs: of the Village College in Impington, Cambridgeshire, realised 1939 (Fig.13); of the Peter Thacher Junior High School in Attleboro (Mass.), realised 1948 (Fig.14), and of the Harvard Graduate Centre in Cambridge (Mass.), realised 1950 (Fig.15).¹⁹⁷

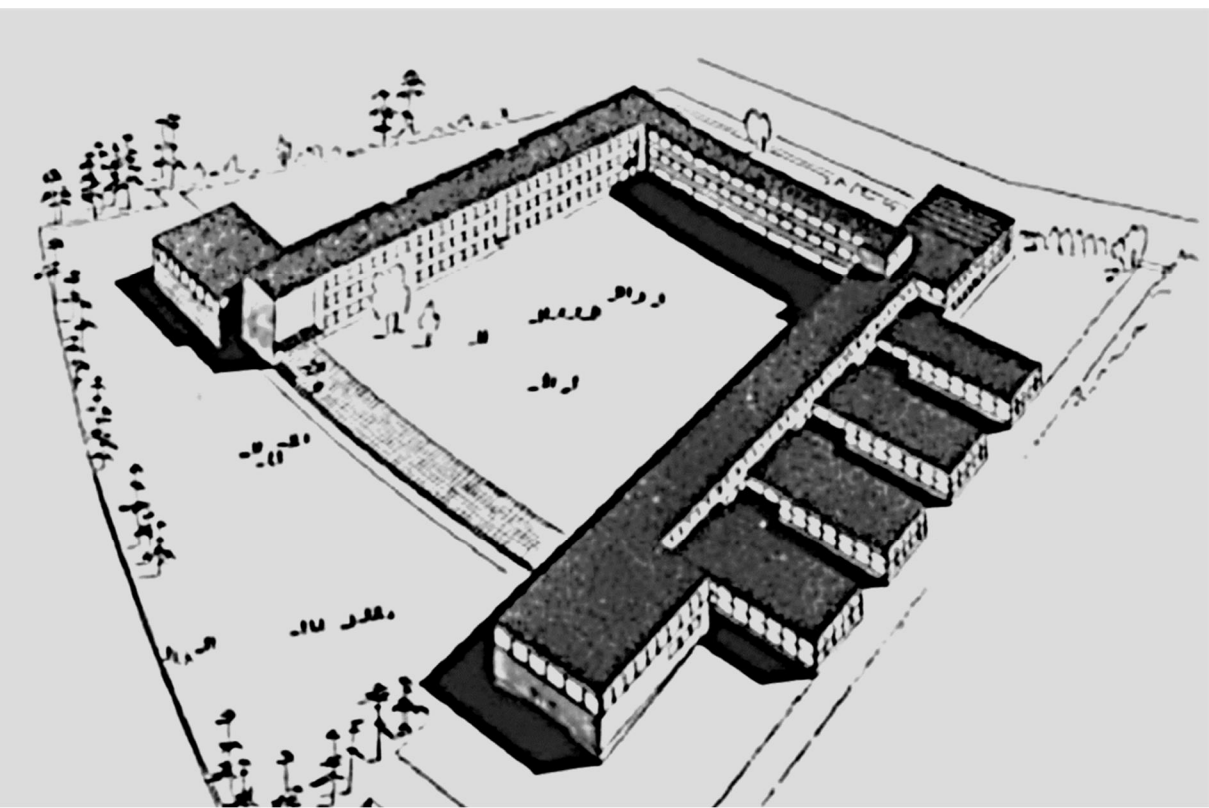
Despite this similarity, the various designs and realised buildings increasingly differ from the Bauhaus building in two ways: First, there is a development to discern in the forming of more and more real courtyard spaces. Spaces along or around which the different sections and wings are arranged and by which the moment of diverging is more and more counteracted by the presence of a spatial centre: from rather open to completely enclosed courtyards. Here this development towards real courtyards includes an increasing spatial separation between courtyard space and public space. Leaving the Harvard Graduate Centre aside, the courtyard is now to be accessed via the building and not vice versa, as it is the case in the Bauhaus building. More important, however, the creation of enclosed outside space more and more determines the building's overall configuration. The spatial configuration of the school in Hagen still resembles the most the open and diverging structure of the Bauhaus building. In all the other designs the defined outside space becomes the spatial centre of the whole building complex, the centre around which all sections and rooms are organised and to which they are oriented, be it a rather open courtyard as in the designs for Köpenick, Papworth and Impington, or a rather enclosed one

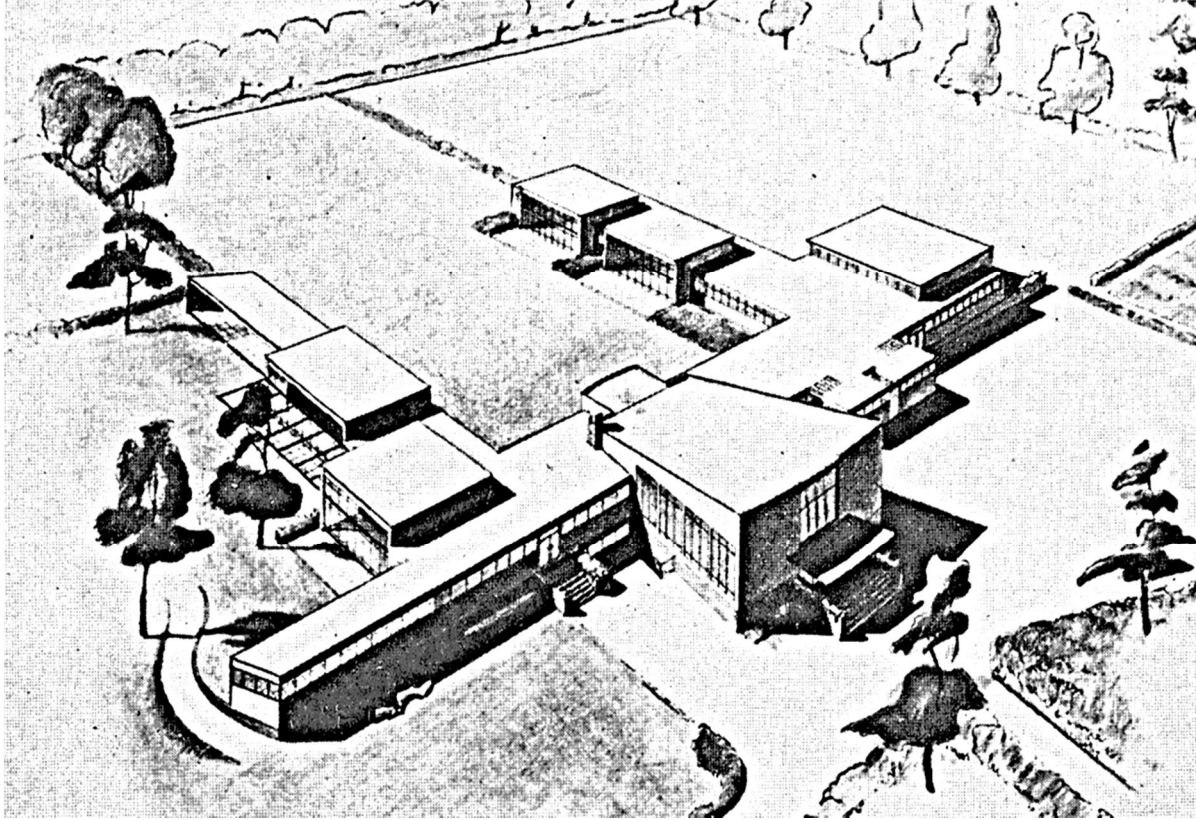
¹⁹⁷ Different to the analysis of the Bauhaus building, the discussion of the space-forming structure of the various designs concentrates on the overall configuration of inside and outside spaces. A more detailed analysis, even of one or two building complexes, is left aside here, since this is not possible to do on the basis of the available documentation. At the same time, for the illustration of the main argument of this paragraph, namely that from the 1930s a fundamental change in Gropius's (implicit) reference to space formation took place, a concentration on the overall configuration seems sufficient for me.



9 School for Mechanical Engineering, Hagen (1929)

10 Training School, Berlin Köpenick (1930)

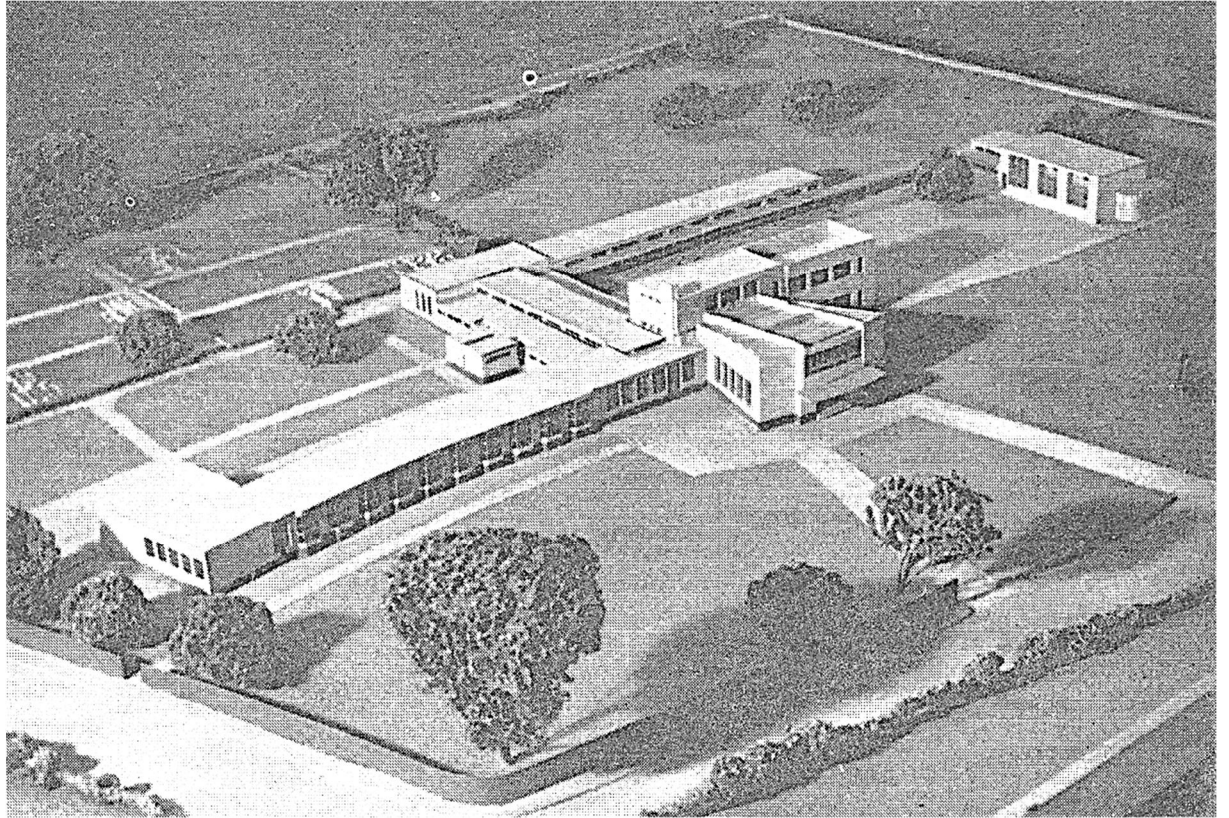




11 School for children with tuberculosis,
Papworth Cambridgeshire (1935)

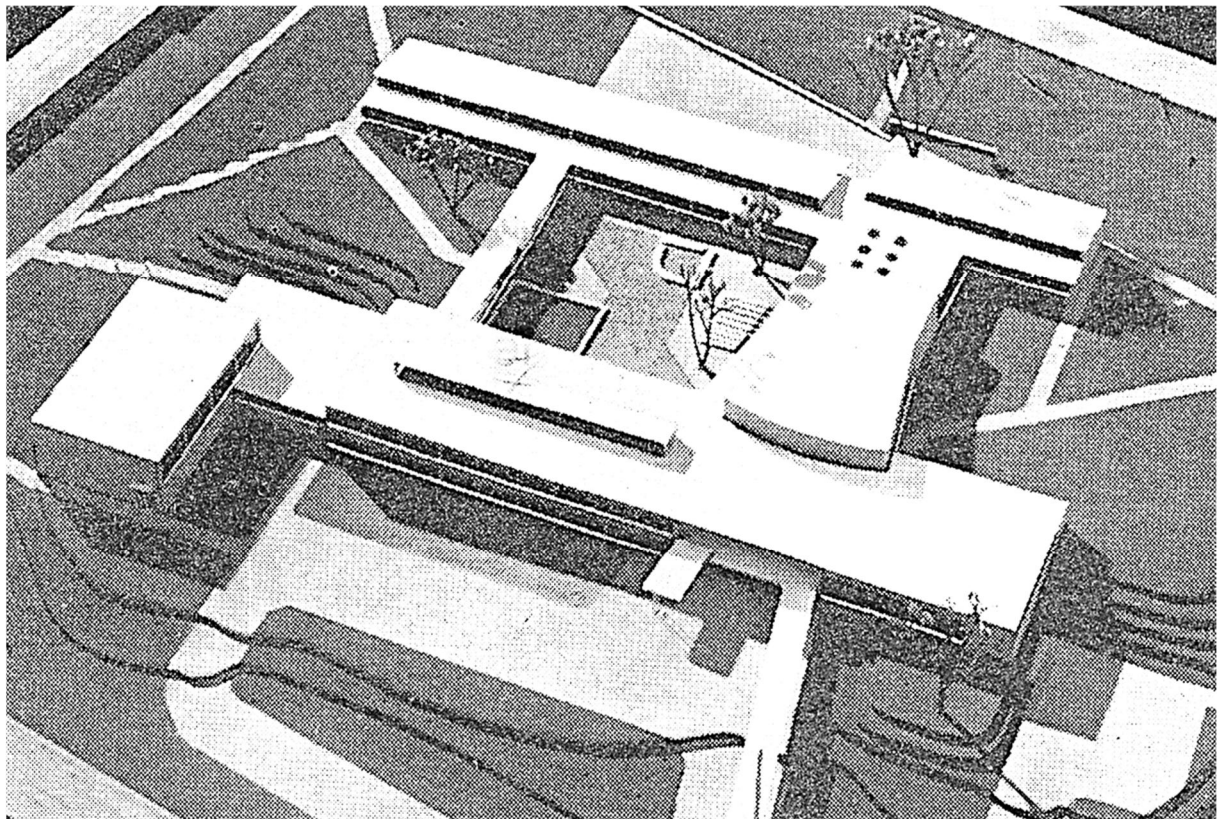


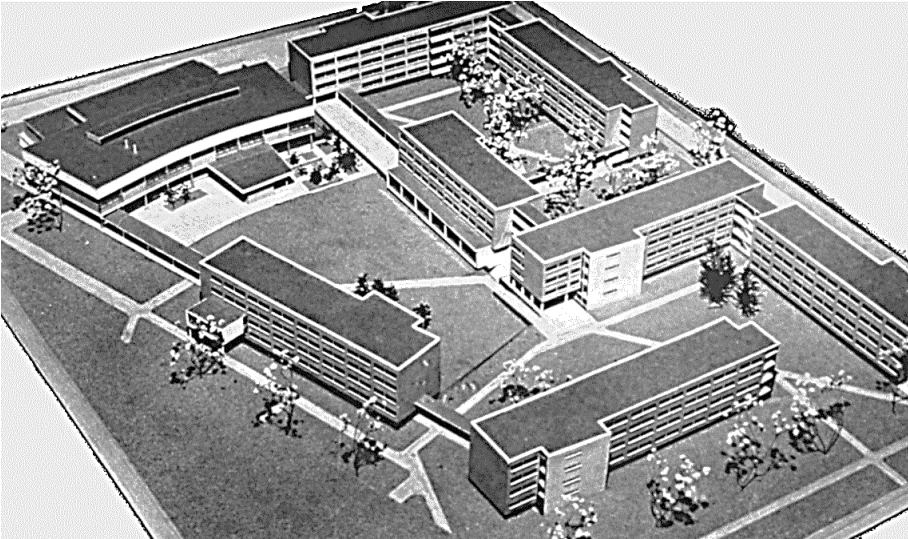
12 Wheaton College Art Centre, Wheaton (Mass.) (1937)



13 Village College, Impington Cambridgeshire (1939)

14 Peter Thacher Junior High School, Attleboro (Mass.) (1948)





15 Harvard Graduate Centre, Cambridge (Mass.) (1950)

as in the designs for Wheaton and Attleboro. In a different way this counts for the Harvard Graduate Centre, as well. In the Peter Thacher Junior High School in Attleboro, the configuration resembles a monastery complex with the central courtyard and surrounding cloister. At the same time, none of the courtyard situations is completely enclosed including that in Attleboro. All are characterised by a different kind of openness and the resultant integration of the defined courtyard space in the spatial surroundings. Here the created dynamic between enclosed spatiality and outside orientation ranges from the situation, where the courtyards are merely enclosed at three sides, to solutions, where they are enclosed at all sides in different height and quality.

The second difference with the Bauhaus building is a much more designed inside-out relation between the various inside spaces and the outside space. First, the different courtyard spaces are directly and at many places accessible from the buildings inside. Next to this, the use of completely glazed facades allows for the creation of a distinct interpenetration between courtyard and inside space—be it classrooms or corridor spaces. In terms of the latter, the courtyard indeed continues into the building and the corridor becomes an integrated part of the courtyard, as in the design for Papworth, Impington, and Wheaton.

The different kinds of configuration and immediate inside-out relations lead to a quite variety of how the building's inside is related to the outside. Yet, and owing to the presence of a defined outside space, it is always a two-part relation. It is a two-

part inside-out relation by which the defined outside space always functions as a mediating space between the actual as it is covered interior and the surrounding open space. The most layered interplay between enclosed spatiality and outside orientation is to be found in the design for the Wheaton College Art Centre. Here a completely glazed entrance and exhibition hall with adjacent glass corridors creates on the ground-floor level a spatial continuity between the two courtyard spaces and the surrounding park. At the same time, the entrance hall and courtyards together enclose the central lying auditorium and the very heart of the building complex. At the same time, this auditorium encloses together with the opposite building blocks, the one above, the other opposed to the entrance hall, in turn the courtyard.

As a result, this variety of how the building's inside is related to the outside shows that, for Gropius, the creation of an interplay of enclosed spatiality and outside orientation became a central issue of architectural design, at least in connection with educational buildings. Unfortunately, there are no comments of Gropius on the kind of an architectural space formation that is to be found in different designs and buildings. Also, there are no other general statements of Gropius from the post-Bauhaus period that would allow to draw any conclusion from this explicit orientation towards space formation. It would be very interesting to get to know by what this change was initiated and how far it implied a critical reflection of the earlier architecture and his early approach to (the perception of) space and mere implicit and rather technical reference to space formation. Instead, it has to remain open whether and how far this shift included a conscious examination of both. Nevertheless, this shift took place, and it did so not only in relation to educational buildings, as we will see in the following part.

4.2.2 From Wabenbau to Gropiusstadt: Architectural Space formation in the Context of Typification in Residential Building construction

Gropius's first attempts to implement the concept of typification in residential building construction were rather experimental in nature. It was in 1922 that he worked on the so-called 'Wabenbausystem' (honeycomb construction system, Fig. 16), together with Fred Forbát, assistant of his architecture studio affiliated to the Bauhaus. As part of the proposed establishment of an artists' colony in Weimar in 1922, they proposed a 'Bauhaussiedlung' of detached houses—which specific feature was to be built by means of a specific systems-building construction. In the accompanying text for the exhibition design at the Bauhaus, they wrote:

A proposal, 'Wabenbau', serial manufacture of single-family homes, large variability of the same basic type via scheduled installation and construction of associated room cells depending on head count and the needs of occupants, making principally use of accessible roofs.¹⁹⁸

As this statement points out, the essential element of the proposed 'Wabenbausystem', different from what the name suggests, was the linking of standardisation and variability. Based on an extensive standardisation of construction components, the system included different types of honeycombs. Based on a four-part core of honeycombs, the system allowed various forms of horizontal and vertical incorporation of additional honeycombs, optimised in shape and volume depending on respective use. A year later, under the title 'Baukasten im Großen' (large-scale construction set, Fig. 17), an improved version of the Wabenbausystem¹⁹⁹ was presented at the international architecture exhibition in Weimar. In addition to a larger number of different 'supplementary honeycombs' as well as a higher grade in variation, and therefore, more types of houses, the 'Baukasten im Großen' was particularly characterised by the two-storey nature of the central living space.²⁰⁰ Both systems refer to space formation almost exclusively in terms of sizing and spatial arrangement. They do so by standardising the spatial arrangement of use-optimised volumes of space within the total complex of various sub-uses. The arrangement is organised in such a way that the living room principally forms the spatial centre of the house. It is surrounded by a variable number of honeycombs for other specific use. With this principle order, the arrangement reveals a certain socio-spatial logic, more clearly expressed in the adaptation of the Wabenbausystem to the Baukasten im Großen. Here the central living room is designed as a two-storey space, enclosed at most by three sides, whereby it always maintains a clear outside relation. The sizes and shapes of the different (honeycomb) volumes and their spatial arrangements result from the need for a standardised interconnectivity as well as from their use and use-related arrangement. Although this use-related and socio-spatial organisation is necessarily overshadowed by the aim of standardisation and (variable) typification, the Baukasten im Großen, in particular, reveals the socio-spatial logic that underlies it. Though, this

¹⁹⁸ As quoted by Paul Klopfer (Klopfer, 1922)

¹⁹⁹ Developed by Gropius and Adolf Meyer. The main motivation for the development of both construction systems was to advance the standardisation of residential building construction, and, in this vein, to contribute to lower-cost building construction. However, both the presented designs failed to deliver a construction system that could be truly implemented. Obviously, their primary function was to just demonstrate, for the first time, the principle of variable typification in architecture.

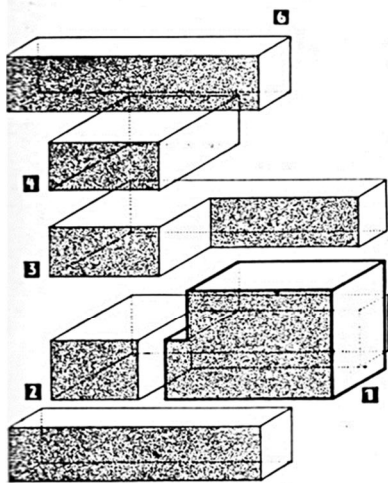
²⁰⁰ Following Matthias Noell (Noell, 2002), this two-storey living room is directly inspired by Le Corbusier's design of the Maison Citrohan.



16 "Wabenbausystem" Model (1922)

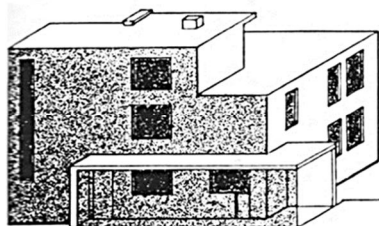
17 "Baukastenn im Grossen" Poster Bauhaus exhibition (1923)

EINZEL - RAUMKÖRPER 1-6



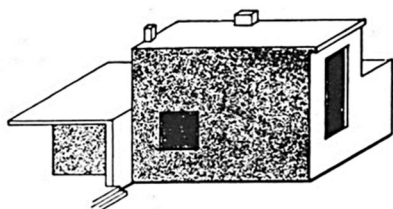
KOMBINATIONEN

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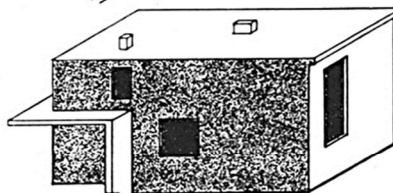


WEITERE KOMBINATIONEN

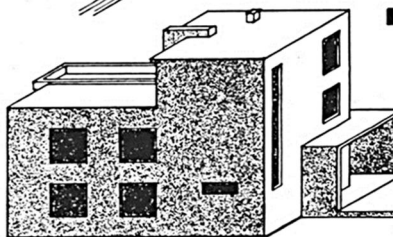
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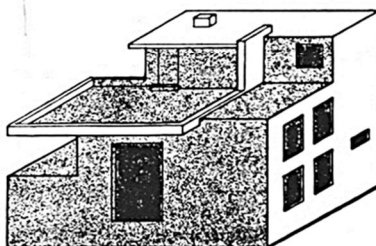
1 2



1 2 3



1 2 3 4



1 2 3 4 5

TYPEN SERIENHAUS VON WALTER GROPIUS

BAUKASTEN IM GROSSEN, AUS DEM SICH NACH VORBEREITETEN MONTAGEPLÄNEN JE NACH KOPFZAHL UND BEDÜRFNIS DER BEWOHNER VERSCHIEDENE „WOHNMASCHINEN“ ZUSAMMENFÜGEN LASSEN

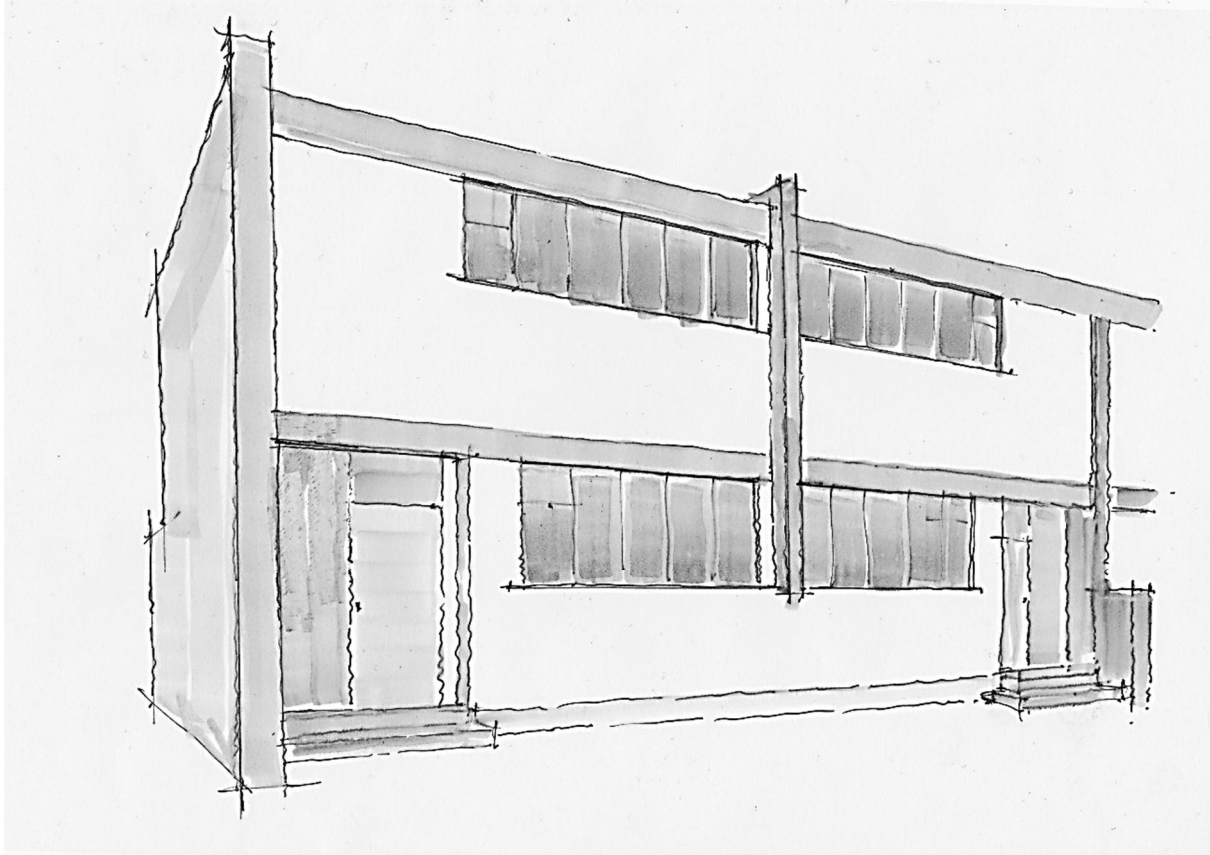
reference remains in the background, and in no way it incorporates the concrete socio-spatial relationship between the occupant and the dwelling. Instead, space formation is present as a practical instrument in the organisation of diverse use and its production–technical implementation. This involves the definition of necessary sizes of and distances in space, of providing necessary quantities of light and air, and of enabling effective sequences of use-related actions.

Dessau Törten

The first opportunity, for Gropius, to practically implement his approach of a typification in residential building construction was the contract to design 314 row houses for a working-class housing estate in Dessau Törten, commissioned by the municipality of Dessau in 1925 (Fig. 19). The various row houses range from 57–75 m² floor space and an additional of 300–400 m² kitchen garden with a small stable for self-supply. Until 1928, three different types were successively designed and built: the so-called type Sietö I in 1926 (Figs. 20.1, 20.2), the type Sietö II in 1927 (Figs. 21.1, 21.2), and Sietö IV in 1928 (Fig. 22.1, 22.1). Different to the projects of ‘Wabenbau’ and ‘Baukasten im Großen,’ this practical implementation of the concept of typification in residential building construction now was embedded in the main objective of a considerable, if not extensive reduction of building costs and the resultant reduction of rental fee. Therefore, a particular feature of this project was, next to the typification of both building elements and the spatial layout, the use of cheap building materials and, even more importantly, the implementation of as much prefabrication as possible.²⁰¹

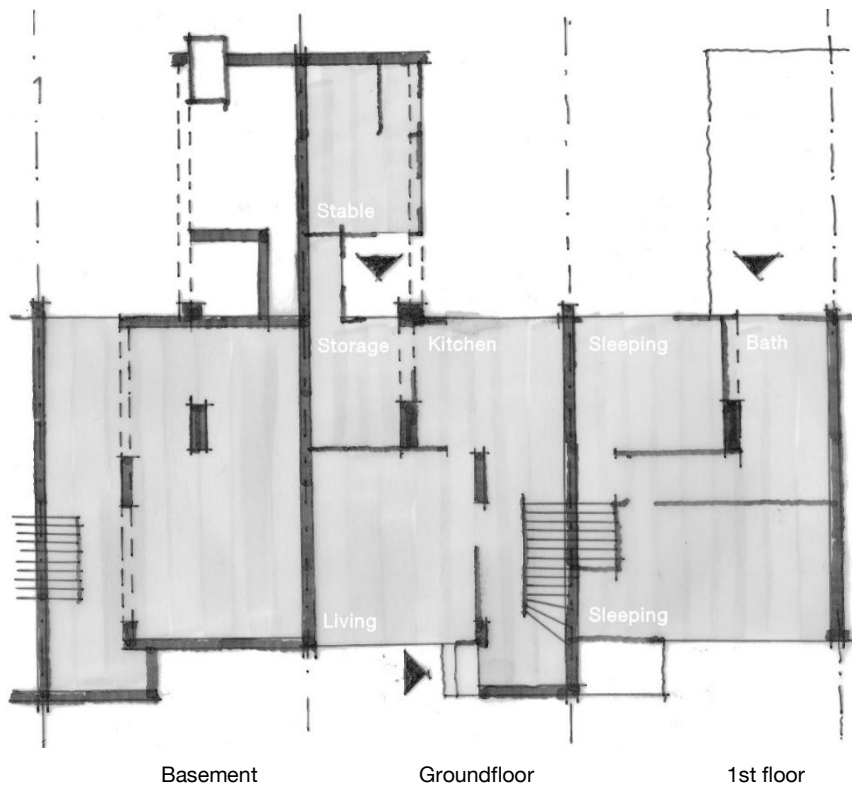
For this reason, the kind of space formation that is to be found throughout the whole project is strongly influenced by this objective. Therefore, it is less the moment of typification that influences the kind and quality of space formation, but rather the strive for an extensive reduction of building costs. Correspondingly, all houses are characterised by a space-saving design, both into horizontal and vertical directions (Figs. 23–25). In addition, this design is characterised by the use of small stairs, with or without a small hall or hallway, around which at each level either two, three, or four rooms are situated. The types Sietö II and Sietö IV show a clear distinction between a front- and back-zone with the living room in the front and the kitchen at the back. Here the ground floor of Sietö II additionally profits from a hallway that

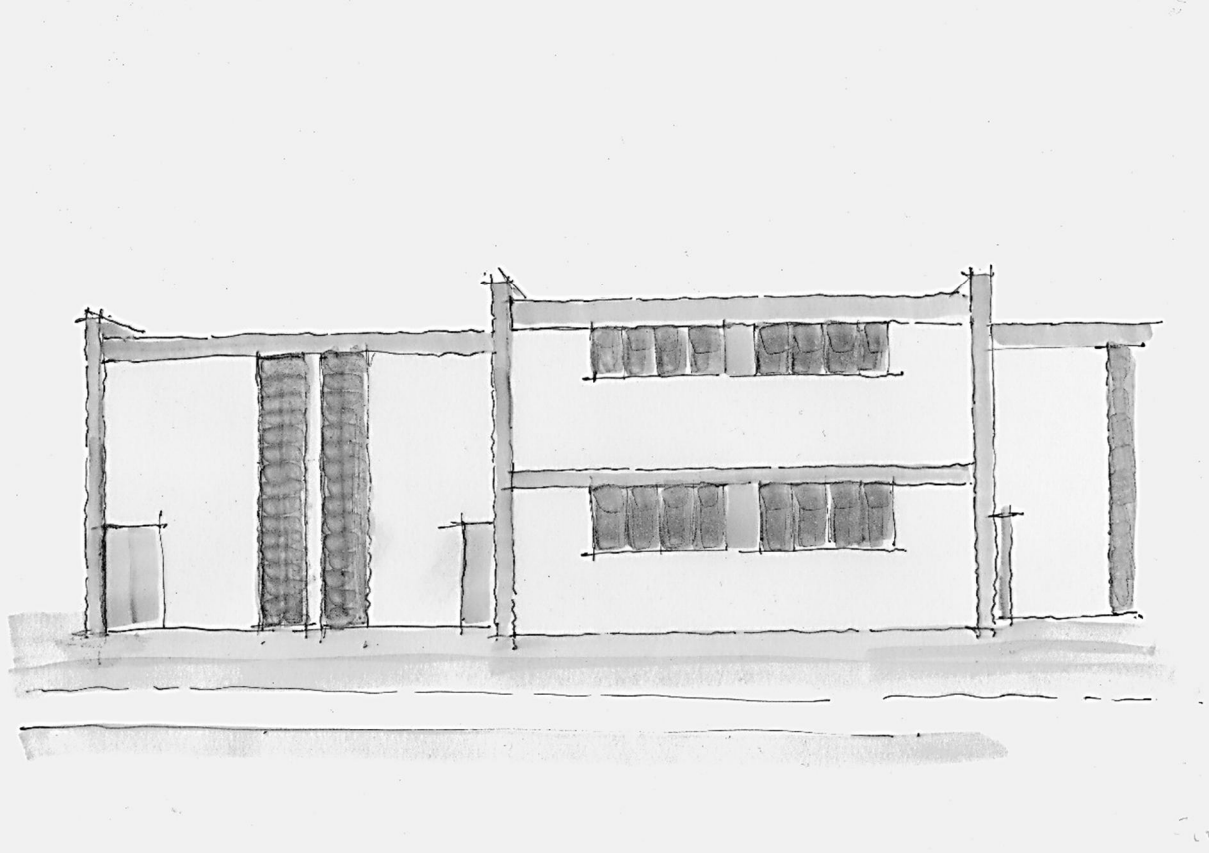
²⁰¹ As a result, the 130 houses of the type Sietö IV, the smallest type with 1 ½ floors, were erected in 1928 on site in the amazing period of only 88 working days.



20.1 Dessau Törten, type Sietö I street facade

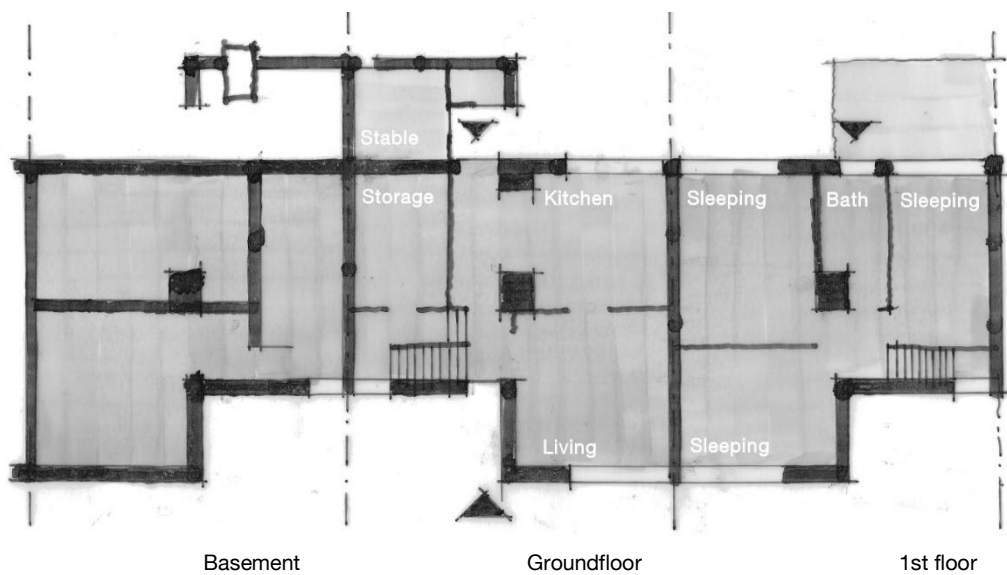
20.2 type Sietö I (variation I.2) floorplans

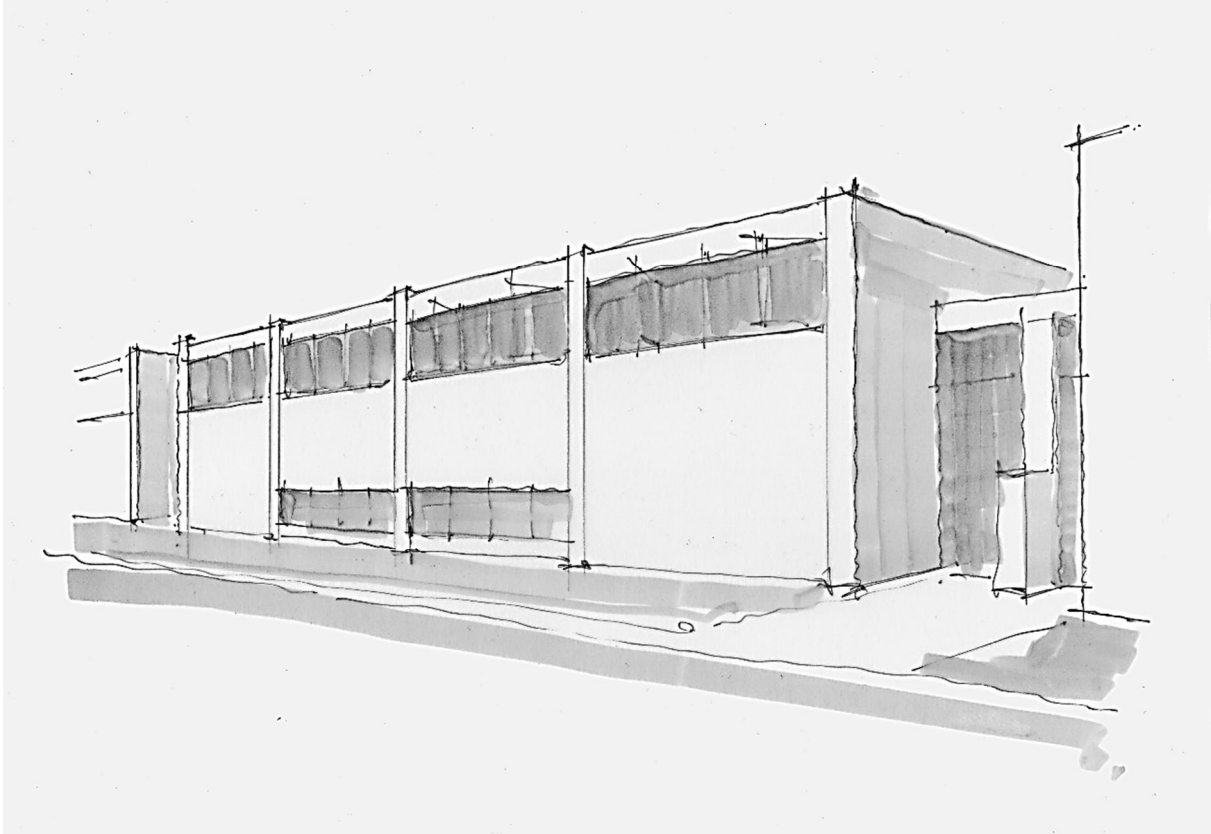




21.1 Dessau Törten, type Sietö II street

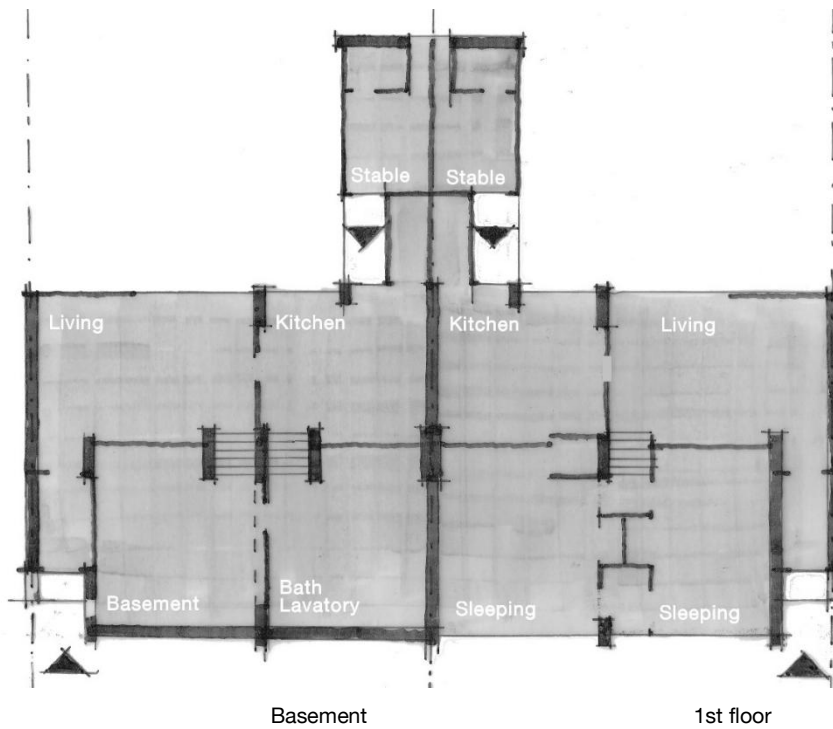
21.2 type Sietö II floorplans





22.1 Dessau Törten, type Sietö IV street facade

22.2 type Sietö IV floorplans



runs from the entrance to the back door—in case of Sietö IV, this front–back distinction is strengthened by an additional separation into the vertical direction, resulting from there being implemented into a split-level arrangement. As a result, the clearest spatial order is realised in type Sietö II with a clear front–back distinction that simultaneously connects the front and back of the house through the hallway and a door between the front lying living room and the kitchen in the back. Furthermore, all types include a small stable behind the kitchen—in Sietö I and II complemented by an above-lying terrace, accessible from a sleeping room. Owing to its projected position and the principle mirrored arrangement of houses, always two stables with terraces above separate two gardens that are situated in between. The other element that strongly influences the kind of space formation throughout the whole project is the arrangement of the various house-types along the different streets—their positioning in relation to one another. This arrangement is characterised by a monotonous mirrored arrangement of identical row houses with set-off in sections of eight or more interconnected units (Fig. 18). Obviously, this kind of arrangement was also determined by the aim of an (extensive) reduction of building costs.

Next to the space-saving configuration at the inside and the monotonous configuration along the street, however, it eventually is the (lacking) spatial relation between each house and the residential street that characterises the present kind of space formation. Since a better design of the inside-out relation would have provided the possibility to counteract both the negative impact of the space-saving design at the inside and the monotonous configuration at the outside, I will look in more detail at the designed inside-out relation between the building's interior and the street. The relation with the garden side I leave aside, since the dwelling concept of the whole plan did not conceive the garden as a space for recreation, but rather, and in unity with the stable, as a working area. This does not mean that here the dwellings would not also have benefited a lot from a better designed inside-out relation. But this dwelling concept asks for a better relation between houses and streets, particularly in the setting of a working class neighbourhood, where the street, certainly at that time, was traditionally used as a collective space.

Confirming Gropius's technical focus on the aspect of opening, however, the inside-out relation in all types is first and foremost production—technically designed: The form, size, and position of each window seems to be exclusively determined by the assigned function to bring the necessary amount of natural light in the various rooms. This counts for the street side as much as for the garden side. Particularly, the ribbon windows in the various living rooms on the street side (Sietö I and II) are far from creating a satisfactory inside-out relation. The same goes for Sietö IV, where

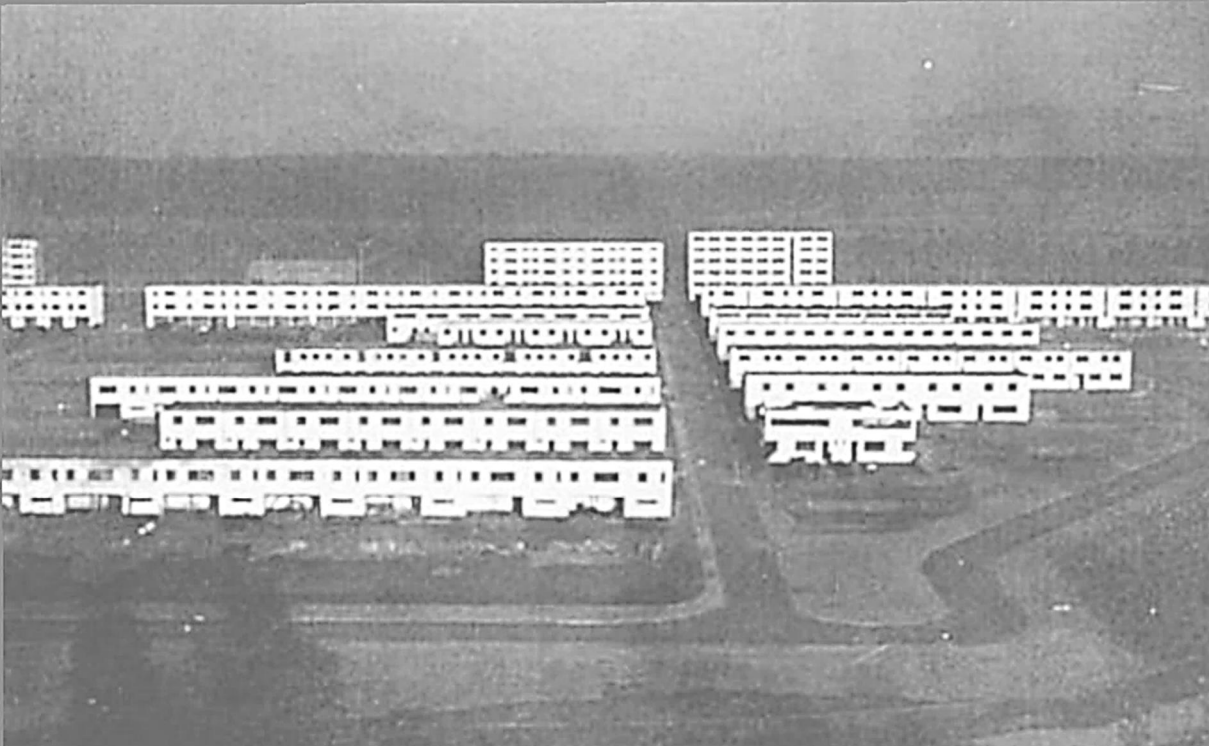
the split-level arrangement implies an additional spatial separation between the ground floor and street.

With the variation I.2 of the Sietö I type, Gropius introduced the aforementioned set-off on the street-facing side of the houses. In this variation, the living room sets off, in Sietö II and IV it is the entrance hall. However, a real spatial relation between the inside and the street is generated neither with the one nor the other solution. Instead and despite the set-offs, the various meandering facades remain—in aesthetic, or rather socio-spatial aesthetic terms—dead facades. This is because the series of firewalls break up the interconnected row houses into a series of aligned but separate units. At no single corner the façade goes around, whereby the impression of enclosing gets consequently negated and replaced by the expression of separation. Accordingly, no interplay between enclosing and opening is to be detected. Instead, the separating and opening elements are positioned above one another and in almost one line. As a result, the applied ribbon windows do not open, but rather neutralise the separation of the inside that lies behind. This effect of neutralisation is complemented by the monotonous application of the ribbon windows and the too high balustrades at the ground floor level. It is further complemented by the monotonous arrangement of the set-offs and the missing interplay between the set-off and the ribbon windows on both floors. Only in the variation of Sietö I, a spatial relation between two houses is created by the entrances lying opposite to each other and the steps lying in front that guide one along the ribbon window of the living room.

This strange neutrality between different kinds of defined spaces also applies to the relation between the defined street space and the adjacent outside space. It is difficult to evaluate this spatial relation as the 314 houses designed by Gropius just formed the beginning of a yet to be realised building structure. At the beginning and end of the straight street, which is defined by the Sietö I houses, an intermediating entrance situation is designed at least in a rudimentary way. Also, the implementation of the flexed street with the Sietö II houses on either side and the curved street with the Sietö IV type indicates the aim of giving both streets somehow a spatial limitation, thus definition.

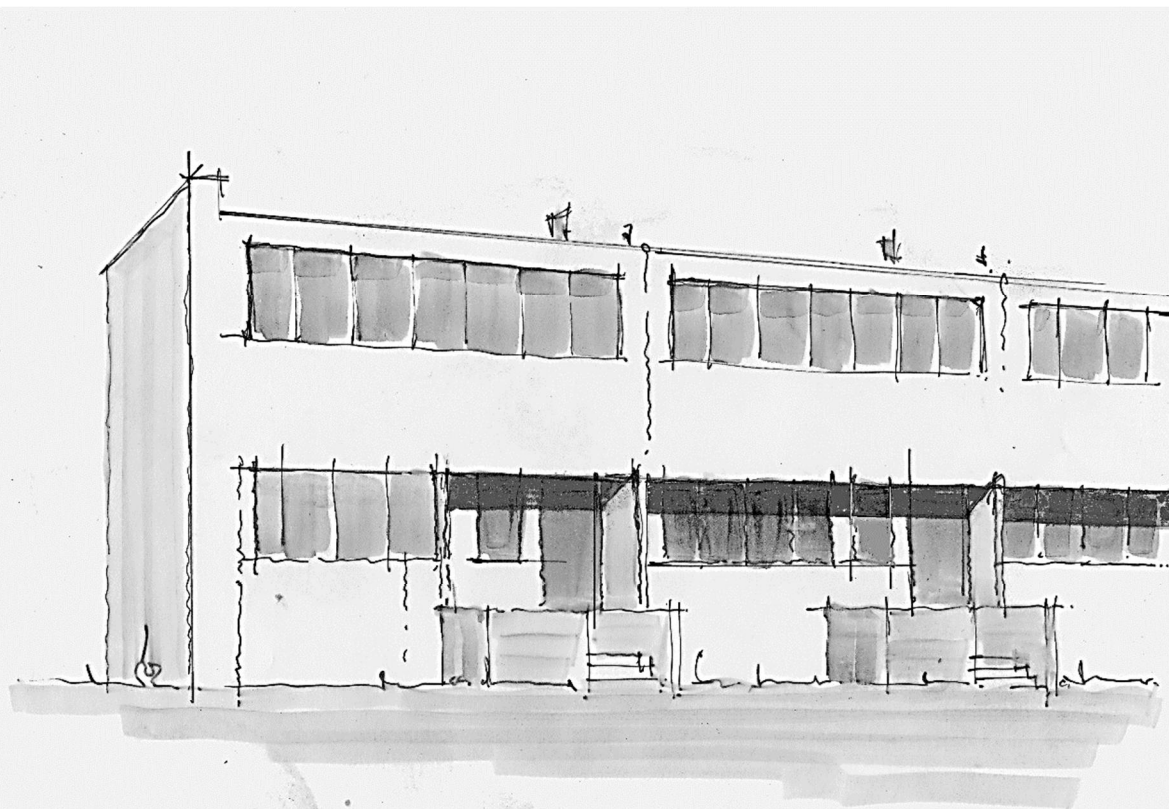
Dammerstock

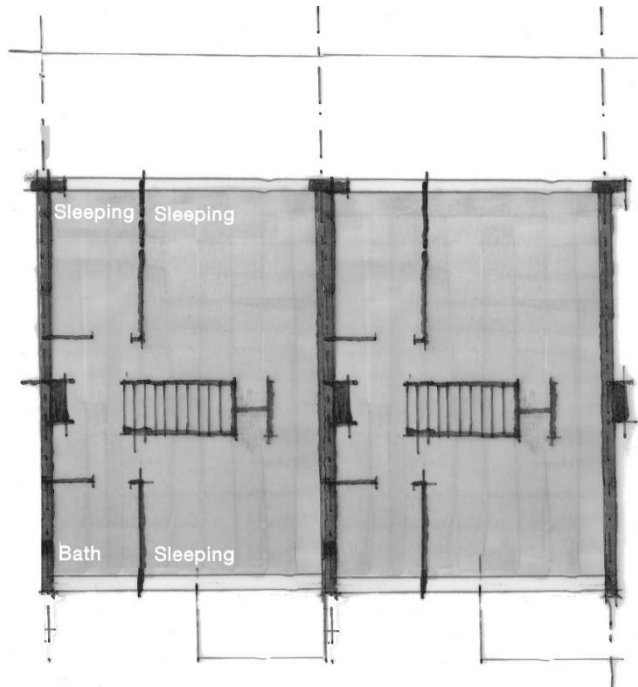
In 1928 and 1929, Gropius worked on the 'Dammerstock' housing estate in Karlsruhe (Figs. 23, 24). On the basis of an urban planning competition that he won, he was commissioned with the supervision of the general planning of the settlement and the realisation of 400 one-family row houses and 350 apartments. Next to two



23 Dammerstock, arial view

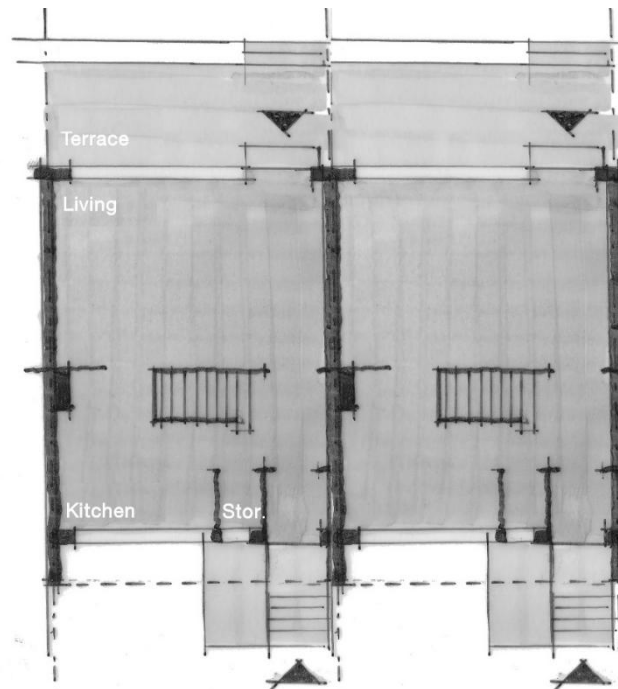
24 Dammerstock, rowhouses street facade





25.1 Dammerstock, rowhouses 1st floor

25.2 Dammerstock, rowhouses groundfloor



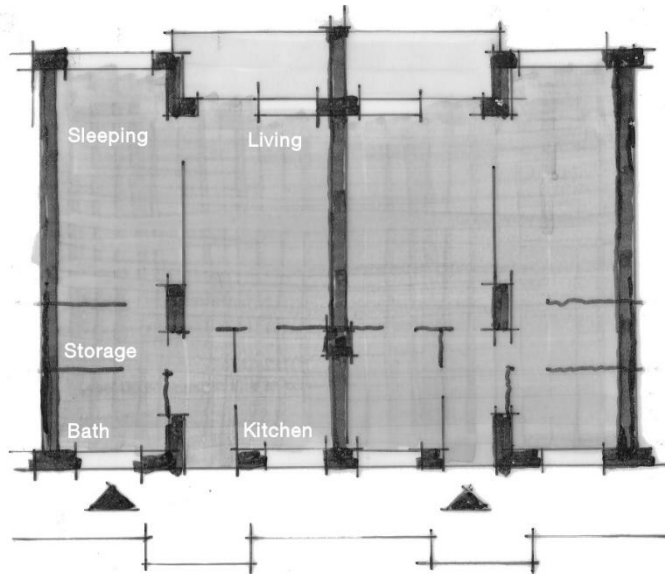
apartment blocks (Figs 26, 27), Gropius designed several two-storey row houses of one type (Figs. 25.1, 25.2). Though these row houses were also conceptualised by Gropius as space-saving dwellings and with a similar size as those in Dessau Törten, they considerably differ in terms of the realised inside-out relation, but also with regard to the internal layout. First, a different position of the staircase, now with a transverse orientation in the middle of the house, and between the kitchen at street side and the living room at garden side, and between two sleeping rooms on first floor, results in a very clear and flexible division of the inside into two zones—one oriented to the street and one to the garden. Furthermore, this layout implies a closer relation between kitchen and living room downstairs and between the four sleeping rooms upstairs. Second, this internal clearness and spatial unity is complemented by the design of two defined outside zones: A covered entrance zone that mediates between the entrance hall, on the one side, and the lower street and front garden, on the other side; a covered terrace that mediates between the living room and the lower garden at the back side. As a result, this design differs from the Dessau Törten houses in generating a dynamic inside-out relation. It does so, by combining a direct spatial relation between the living room and the outside with an elevated ground floor and two defined outside zones at both sides of the houses. Furthermore, owing to the continuous elevation from the street level and the non-visible compartment walls, the various houses in one and the same row form a continuous shape, whose internal differentiation is designed by means of spatially defined inside-out zones. Despite the even more monotonous ‘Zeilenbau’ layout with its strict north–south orientation and the corresponding principal spatial isolation of the various rows from one another, the neutrality between houses and streets, characterising the Dessau design, is not present. It is the spatially defined and aesthetically effective inside–out relation that prevents this.

Another kind of typification in residential building construction

Next to this difference, the Dammerstock project fundamentally differs from the project in Dessau Törten in the preoccupation with, and the application of, a completely different residential building type: the multistoried apartment building. In the residential building projects that had to come, and leaving the design and realisation of several detached houses aside, Gropius focused on this type of typification. Accordingly, the object of typification was, from now on, no longer the row house but the multistoried apartment building. Here all future designs were based on two basic

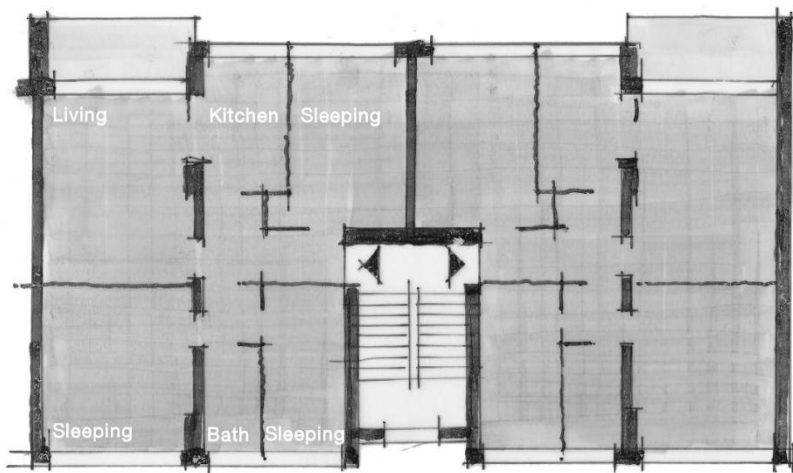
apartment types, combined with two kinds of circulation and both realised for the first time in the Dammerstock settlement. First, there is the apartment type that comprises two rooms plus a kitchen, bathroom, and a balcony in front of the living room; it was built in combination with the circulation via an access gallery (Fig. 26). Second, there is the apartment-type comprising more than two rooms plus a kitchen, bathroom, and a balcony in front of the living room; it was realised in combination with the circulation via decentral staircases (Fig. 27). In terms of the interior design, the various realisations of both apartment types are again characterised by a space-saving and compact arrangement of the different rooms around a central hall.

In the smaller dwellings that are arranged along an access gallery, this hall (ca. 1,50 x 2,50 m) is positioned behind the front door and separated from the gallery by a small porch. Another characteristic of this dwelling type is that every room has two entrances by which a continuous circulation through all rooms is possible, next to the direct access of kitchen, bathroom, and living room from the hall. The balcony in front of the living rooms is accessible only from there. In the two bigger dwellings the central hall, now an L-shape (ca. 1,50 x 3,00 x 3,50 m), lies in the middle of the apartment between front and back side. Interestingly, only the kitchen has two entrances—from which we may assume that the ‘open’ solution of the smaller apartment was determined by the necessity to create access to the sleeping room rather than to create a continuous circulation. If this would have been Gropius’s primary intention, he also would have changed the L-shape hall of the two bigger apartments into a square room of 3 x 3 m, which would have led to a similar circulation within the dwelling as a whole and around a spatial centre.



26 Dammerstock, type gallery access

27 Dammerstock, type staircase access

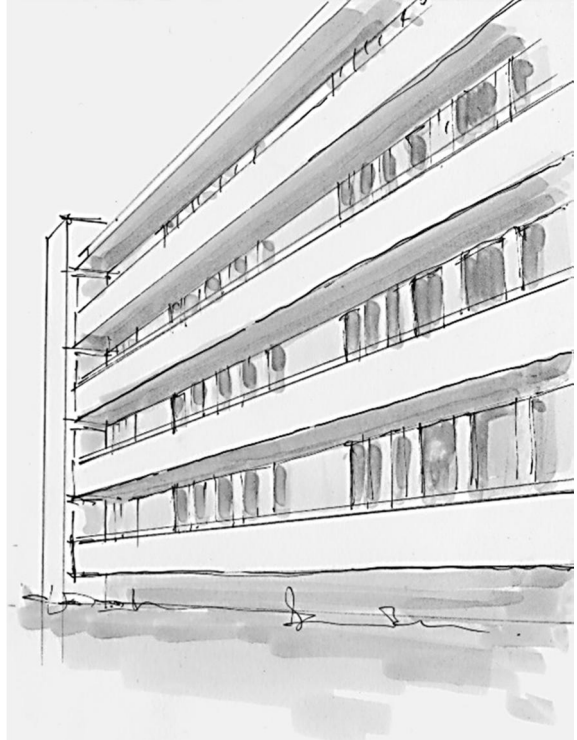
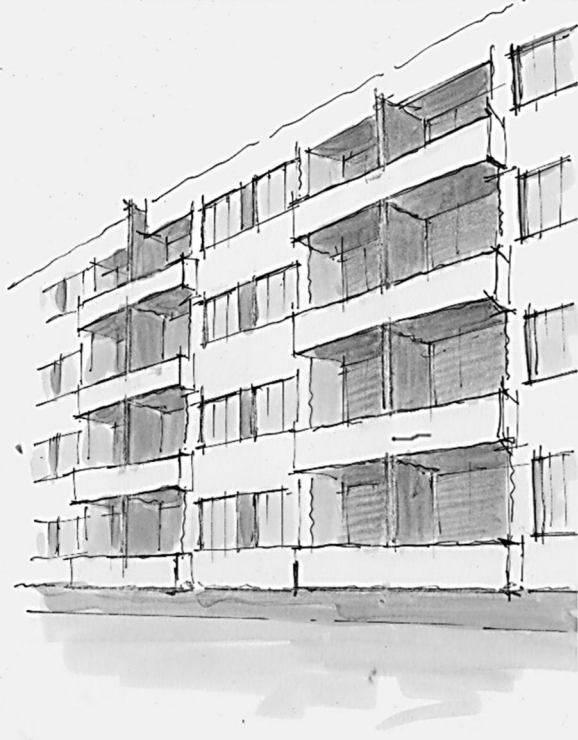




28 Berlin Siemensstadt, aerial view

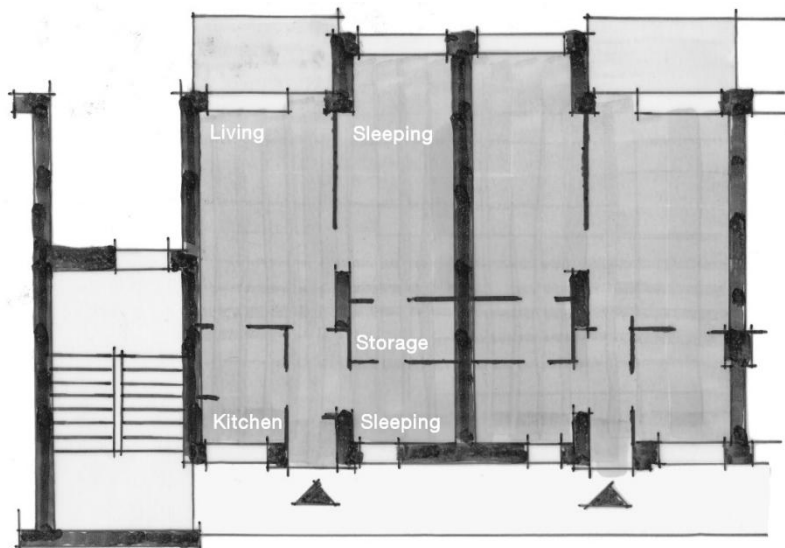
Siemensstadt

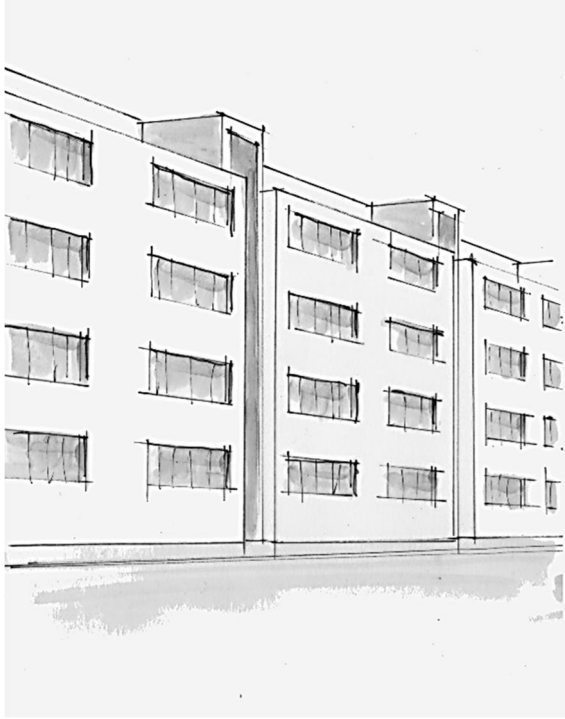
For a further analysis of the kind of space formation that characterises this kind of typification in residential architecture, I have selected Gropius's contribution for the settlement 'Siemensstadt' in Berlin, completed in 1930 (Fig. 28), where he realised both apartment types into three different four-storey apartment blocks: one with access gallery and staircases at either end (Fig. 29.1, 29.2) and two with staircases positioned between every second apartment (Figs. 30.1-31.2). Initiated by Martin Wagner, then director of Berlin's planning office, the urban plan for the Siemensstadt was designed by Hans Scharoun. Next to him and Gropius, Otto Bartning, Hugo Häring, and two others architects were also commissioned with the design of two or more apartment blocks. As in the case of the row houses in Dessau Törten and Dammerstock, this analysis focuses on how in the different blocks the dwellings are related to the outside, and, as a part of this, are related to one another. This is because the design of these relations principally has the potential to again counteract the monotonous building-configuration that almost necessarily results from the typification in residential architecture. And since any apartment building implies the arrangement of a series of identical dwelling types not only in horizontal but also in vertical direction, it is characterised by an even higher grade of monotony. And depending on the number of floors, this monotony in configuration gets complemented by an increasing spatial separation between inside and outside as well as between dwelling and street or garden.



29.1 Siemensstadt, type gallery access, street and garden facade

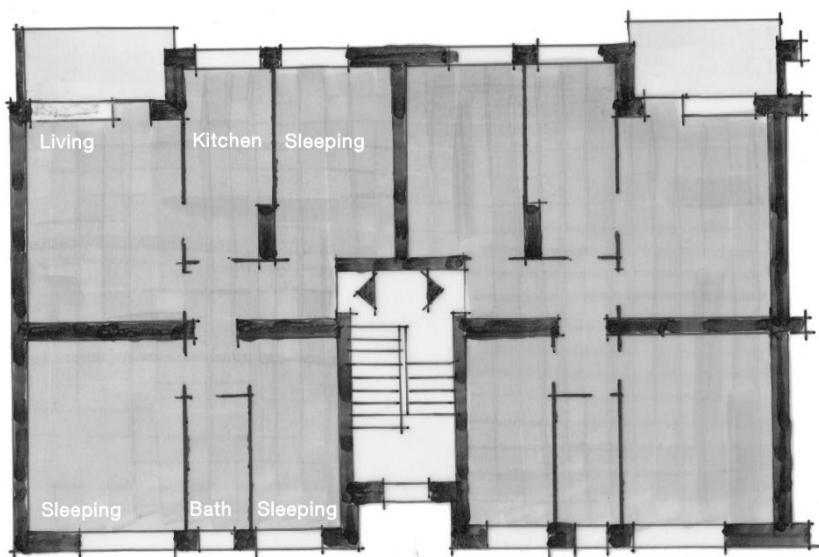
29.2 Siemensstadt, type gallery access

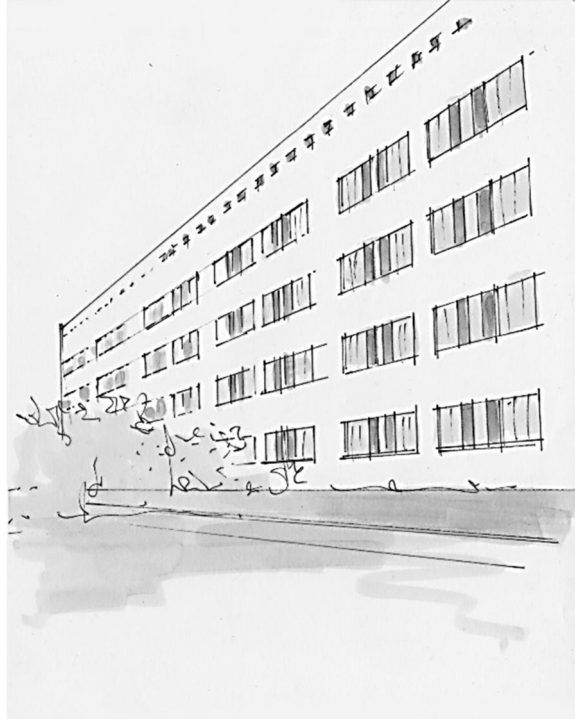




30.1 Siemensstadt, type staircase access A, street and garden facade

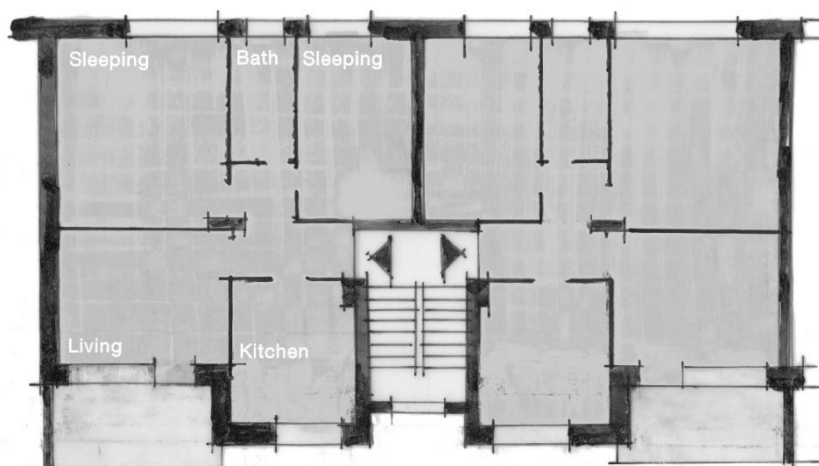
30.2 Siemensstadt, type staircase access A, floorplan





31.1 Siemensstadt, type staircase access B, street and garden facade

31.2 Siemensstadt, type staircase access B, floorplan



Starting with the overall spatial configuration of the apartment buildings, this configuration is first characterised by the mirrored arrangement of one apartment type and a uniform layering of this arrangement over all four floors. Since all ground floors are elevated half a meter, all apartments have on either side the same inside-out relation with identical windows and (access-)balconies. Owing to this uniformity, at all sides (the impression of) one coherent building that consists of a series of identical dwellings is created. Within this unity the four levels are lying above one another as separated layers. The stronger the horizontal layering comes to the fore, the stronger the separation between dwellings and outside. This mainly counts, of course, for the block without balconies along the street.

Accordingly, it is the presence of balconies that generates a space-forming quality within the building structure of all blocks, although the missing integration of the opening of the adjacent kitchen or sleeping room into the balcony space leads into a certain disintegration of the respective façade into a subdivided surface with various independent openings arranged next to one another. But the space-forming quality of the balconies in terms of the created inside-out relation should not distract us from the fact that in terms of the overall spatial configuration of each block the spatial relation between the different dwellings is characterised by a positioning next to and above one another. It is a positioning that misses the presence of intermediate spaces that indeed would create a spatial relation between the dwellings amongst one another and with the surrounding outside next to the individual outside relation through the balcony.

At the same time, however, this spatial separation is counteracted in different ways. Starting with the balconies in block A and C, the increasing separation is counteracted by a continuous dark brick wall that separates the horizontal cavities in two balcony spaces each. Owing to the contrast in terms of material and colour, this vertically-oriented wall binds the different horizontal layers together, although it does so as a formal means of design. The same goes for the materialisation of all vertical separations between adjacent windows in all the three blocks: Forming together one horizontal opening in the facade, this opening is divided into two or three windows with strips in between, all made of the same dark brick. Taken together, all the above-positioned strips now form again a continuous vertical line that, again in a formal way, binds the above-lying openings and thus layers together.

In block B the separation of the facade in horizontal layers is counteracted in a more space-forming way: The above positioned balconies are bound together in the vertical direction by one continuous glazing in front. This glazing changes the balconies from horizontal cavities to a series of defined spaces that step together, as it were, towards the outside. This effect is strengthened by the fact that the main façade



32 Gropiusstadt, model of Gropius' design

33 Gropiusstadt, First Masterplan (1960)

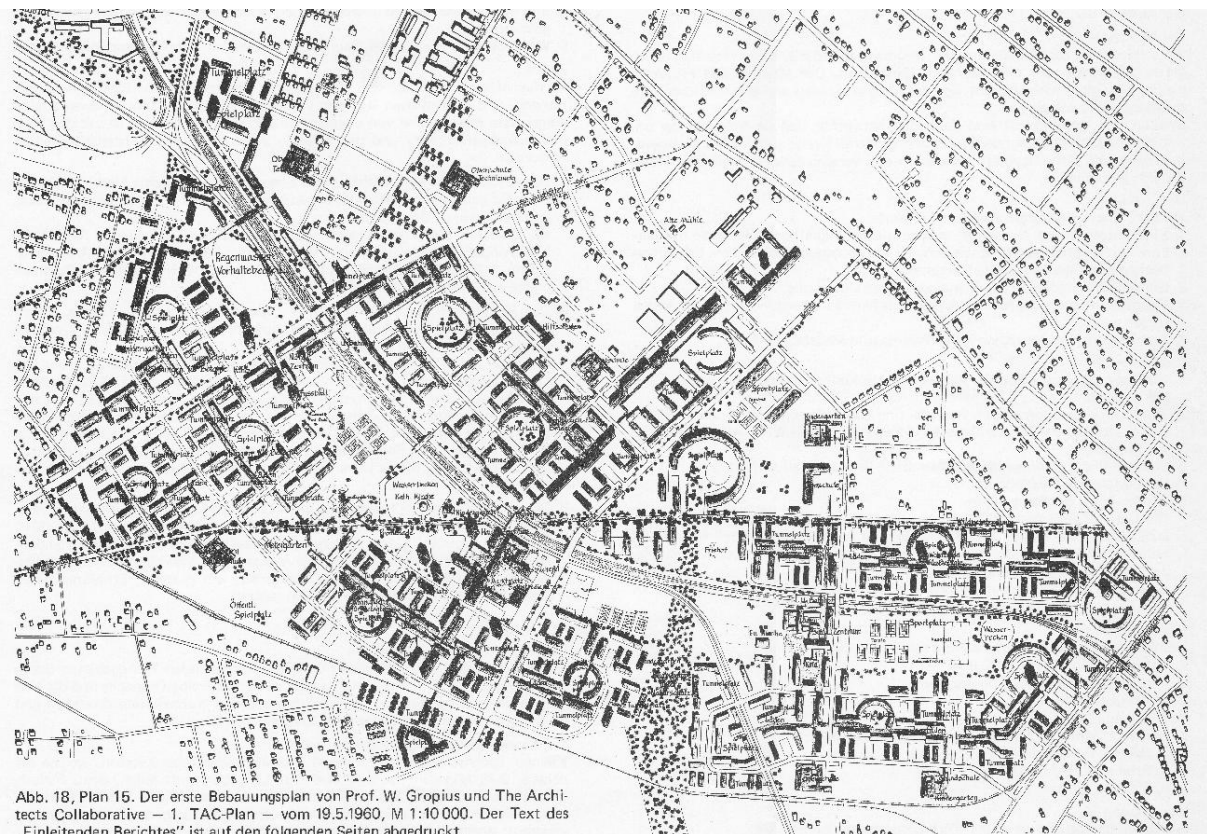


Abb. 18, Plan 15. Der erste Bebauungsplan von Prof. W. Gropius und The Architects Collaborative – 1. TAC-Plan – vom 19.5.1960, M 1:10 000. Der Text des „Einleitenden Berichtes“ ist auf den folgenden Seiten abgedruckt.

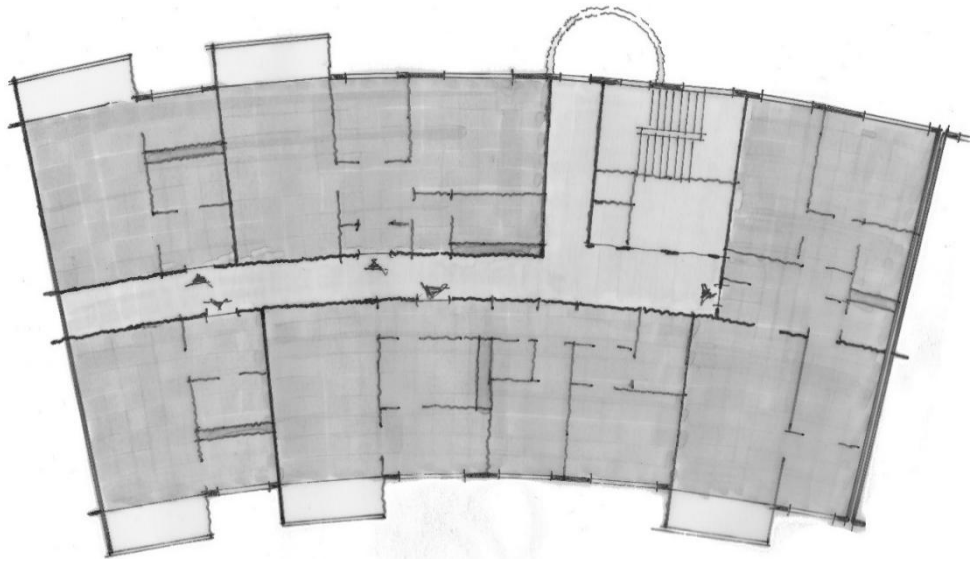
continuous above the glazing in the shape of a recess. On the entrance side of the block B and C, this horizontal layering is counteracted in a fourth way: By the presence of a continuous staircase, which steps back half a meter and is further differentiated from the rest of the facade by one continuous glazing, the horizontal building structure is subdivided into a series of vertical-oriented building sections.

Gropiusstadt – another explicit design of a courtyard space ²⁰²

In 1959, Gropius and his office called ‘The Architects Collaborative’ was commissioned to develop the master plan for the new urban district of ‘Buckow-Rudow’ at the southeast edge of West Berlin. This district was projected with 16,000 dwellings and directly attached to the Hufeisensiedlung designed by Bruno Taut (Figs. 32, 33). As a part of this overall urban development, Gropius was—next to 13 other architectural firms—also responsible for the realisation of one specific section of that master plan. This section lies in the middle of the district and includes the central green area. The programme that was proposed for this s comprised the realisation of 1,100 apartments. In Gropius’s design, completed in 1964, these dwellings were realised in the shape of nine nine-storey apartment buildings, with a length between 50–80 meters and positioned on the west and the east side of a central forest-like area, and a 18-storey semicircular building that shaped a defined outside space with a diameter of about 100 meters on the north side of the same forest-like area (Figs. 34, 35). This composition is eventually completed by a 31-storey apartment tower that adds to the monumentality of the semicircular building an additional monumentality in the vertical direction, although the semicircular shape is already almost 50-meter high. The different dwelling-types considerably differ from those of the afore-described projects. They are characterised by a one-sided orientation towards the outside. In the nine-storey apartment buildings and the 18-storey semicircular building the different dwellings are therefore arranged back-to-back along an in-between positioned corridor, which is accessible via staircases and elevators, positioned between the dwellings on a regular basis (Figs. 36, 37).

I have selected this project as the last case in the examination of Gropius’s (implicit) use of space formation in the context of residential building construction. This is because it is Gropius’s only residential building design, where the shaping of an

²⁰² The original name of the new urban district was ‘Buckow-Rudow’. In 1972, when Gropius was already dead, it was changed in Gropiusstadt.



34 Gropiusstadt, semicircular high-rise building
section of floorplan

35 Gropiusstadt, view onto semicircular high-rise building



enclosed outside spaces is explicitly implemented. In some earlier and not realised housing projects, all designed in 1929, the presence of defined outside spaces was the result of a distinct Zeilenbauweise with rather long apartment blocks, which were four, five, or even twelve stories high, and thus they were not explicitly designed as courtyards.²⁰³ In this project, however, Gropius explicitly used the courtyard as a means of design in residential architecture. On the one hand, this was inspired by Bruno Taut's 'Hufeisensiedlung' (notably built between 1925 and 1933 in parallel to the various housing projects of Gropius) and the applied combination of a central building of a round shape with other residential buildings of linear shape. On the other hand, however, the implementation of such courtyard space in this project is in line with Gropius's increasing realisation of courtyard spaces in educational buildings, as explained before, thus confirms a general orientation towards the design of enclosed outside space and the implied realisation of enclosed spatiality in collective and public space. In the original planning from the late 1950s, the new development of 'Buckow Rudow' was conceptualised to form with the 'Hufeisensiedlung' one coherent district. Accordingly, in Gropius's first plan from 1960, the Hufeisensiedlung is still displayed as a part of the overall plan, and not less than 10 circular housing structures of different size are spread over the newly developed area. Successively, the round housing blocks were taken out and only one remained in the shape of that semicircular highrise slab with 18 (!) floors within the section, for which realisation Gropius was responsible.

The overall spatial configuration of the design for that 1,100 dwellings is characterised by a particular contrast. On the one hand, the nine-storey apartment blocks are positioned as solitaire blocks along and between the green. Although they are arranged in a perpendicular order and somehow aligned with the semicircular shape, their differentiation in terms of orientation and colouring result in the image of a conglomeration of a series of independent massive apartment blocks within a park-like area and a network of residential streets. The shaping of defined outside spaces and of real courtyards that characterises the proposed building structure in earlier stages of planning has been abandoned. In combination with the internal arrangement of the various dwellings within the apartment blocks and their resultant one-sided orientation towards the outside, the whole building structure is dominated by the neutralisation of the spatial relationship between the individual dwelling and its surroundings. And although this is certainly informed by the changed requirement

²⁰³ On these study projects on largescale housing, commissioned by the German government between 1927 and 1931 for further rationalisation in housing, Gropius moved between his work on the Dammerstock and the Siemensstadt housing estates. Compare: Probst, Schädlich, 1986.

to build blocks of nine instead of five stories,²⁰⁴ a different and more coherent space formation would still have been possible to realise. Instead, the problem of an increasing horizontal layering of identical series of dwellings, oriented towards opposed directions, has been ‘solved’, again, at a formal level of design: Now by means of the spatial separation in independent blocks and their differentiation in smaller units with different colouring. This, however, has even worsened the lack in spatial coherence between adjacent blocks as well as between them and the semicircular highrise building.

On the other hand, the arrangement of apartment blocks complements the quiet straight and monumental shape of the semicircular highrise building, which dominates, together with the apartment tower, the situation, independent of from which side one approaches the site. It forms a clearly defined open space, marking (together with the apartment tower) the centre of the whole area by its monumental spatial centrality. Despite its enormous height and monumentality, the space-forming quality of the semicircular building works in the context of the spacious surrounding green, although a stronger and more contrasting opening of the enclosing shape, particularly at the ground floor level, would effectively have increased this quality. It has done so by creating a higher spatial dynamic between the kind of enclosed spatiality and the designed outside orientation towards the street on the other side of the building. Nevertheless, the essential quality of the presence of enclosed outside space may be described in the following terms: Owing to its space-forming characteristic, the enormous separation between inside and outside—it results from the height of 18 floors—is notably counteracted at the higher semi-circular building and not at the lower apartment blocks. It is counteracted by the common orientation of the various apartments and their balconies, positioned at this side, towards the vertical *middelaxis* of the enclosed space, and by so doing, towards that space itself. Furthermore, the separation is counteracted by three passages that penetrate the building at the ground-floor level that are just as oriented towards the centre of the defined outside space. In the apartment blocks, however, this orientation goes, in opposed directions, towards the park as a whole and accordingly trails away there. Owing to the lack of correspondingly defined outside spaces, the spatial separation between inside and outside, which in the case of the Siemensstadt is counteracted by the presence of a defined street space, is not counteracted at all, irrespective of how green and attractive that outside may be.

²⁰⁴ Originally, Gropius had proposed a building structure not higher than five stories; but it was doubled later due to a much higher demand of housing space.

4.3 Conclusion

As far as it was based on Gropius's overall approach to architectural design, I already concluded that his (implicit) reference to space formation coincides with this approach and thus refers also to space formation—it may be in terms of the enclosing, the opening, or the arrangement of spaces—as a practical tool in the designing and therefore in the spatial organisation of life processes. Accordingly, Gropius's reference to space formation at least implies a clear superimposition, if not a substantial neglect, of the immediate socio-spatial meaning of separating and enclosing spaces, of opening and relating rooms, as it involves the corresponding practical emphasis on the spatial arrangement of rooms. In line with his approach to (the perception of) space, a clear notion of architectural space as enclosed spatiality can also not be detected in Gropius's approach to architectural design.

The analysis of the Bauhaus building and various residential building designs confirms this conclusion: In case of these buildings, the primary though implicit reference to space formation concerns the use-oriented arrangement of partitions (or volumes) of space. This is complemented by a corresponding practical and rather technical separation and connection of spaces. Spaces are arranged next to one another; they are not designed as enclosed spatiality, and not related and opened to one another as such spaces. In case of the Bauhaus building, this kind of space formation is combined with a disintegration of the building as a space-forming entity and with a resultant dualism between the building and its surroundings. At the same time, both is counteracted by the design of a central courtyard-like space; the moment of disintegration additionally by a homogeneous façade design. The residential building designs also show a clear tendency towards a spatial separation between inside and outside. It is a separation in unity with a non-designed relation between the dwellings themselves. Almost always, it is a separation between a series of dwellings, arranged next to and above one another within a linear building structure. At the same time, this separation is partially balanced by the presence of balcony spaces and additionally counteracted by the (formal) design of the facade. From Dessau Törten to Siemensstadt, this outside is a street space and somehow spatially defined. In Gropius's design for Buckow-Rudow, we see how important such a defined outside space may be for preventing such separation being turned into a spatial dualism of the building's inside within the surrounding space, as is the case in Bauhaus building.

As stated on the basis of the projects in Dessau Törten, Dammerstock and Siemensstadt, the given kind and quality of space formation is only partially influenced by the implemented typification in terms of the dwelling's spatial layouts. Rather, it is the floorplans themselves, the presence of a defined outside space and

the shaped inside-out relation between the dwellings amongst one another and the outside that primarily determines the given space-forming quality of the building structure. Though the typification of floorplans, particularly with a low variety of types, necessarily leads to uniformity thus monotony in the space-forming structure, this monotony does not conflict with the creation of good spaces and spatial relations with a corresponding (dynamic of) enclosed spatiality and outside orientation. By contrast, the presence of both effectively counteracts the emergence of (the impression of) monotony.

However, on the basis of several educational buildings, a general orientation towards the design of enclosed outside spaces and of courtyards, as well as towards the designing of such a spatial dynamic between enclosed spatiality and outside orientation, could be demonstrated. In the shape of the semicircular highrise building, this orientation eventually found its way also in residential architecture. However, particular the design for Buckow-Rudow illustrates the inconsistent nature of Gropius (implicit) reference to space formation. Unfortunately, since there are no statements from the post-Bauhaus period that would help to explain this changing reference to architectural space formation, there is nothing to explain this inconsistency.

'If space allows people to be alive in it, it will 'become' place. Conversely if we succeed in allowing construction, form or material to 'become' place – an act of poetry and magic – people will know they are alive there and really appreciate 'space' as such. Space experience is thus the reward of place experience. (...) Place is the appreciation of space, that is how I see it'.

Aldo van Eyck, 1962

'To establish the 'in-between' is to reconcile conflicting polarities. Provide the place where they can interchange and you re-establish the original dual-phenomena. I called this 'la plus grande réalité du seuil' in Dubrovnik. Martin Buber calls it 'das Gestalt gewordene Zwischen'.

Aldo van Eyck, 1959

'There are two fundamental kinds of spatial sensation that are compatible with man's primordial nature. They must always been present somehow in what we make - both at once. That is why I have conjured the breathing image and keep asking: when is architecture going to breathe in and out - i.e. just breathe. There is the spatial sensation, which makes us envy birds in flight; there is also the kind that recalls the sheltered enclosure of our origin. (...) The In-between realm provides for both aspects simultaneously?.

Aldo van Eyck, 1962

5 ALDO VAN EYCK'S APPROACH TO (THE PERCEPTION OF) SPACE

In this Chapter Aldo van Eyck's approach to the human perception of space, or rather human relation to space, is explained and comparatively discussed, although an preoccupation with space in itself, that is, with space in terms of three-dimensional extension, is not to be found in Van Eyck's writings. As it goes for Team 10 in general, he focused on human experience and activity *in* space rather than on the perception *of* space.²⁰⁵ What is more, Van Eyck explicitly rejected to refer to space in itself, both in general and in design-related terms – referring here to the notion of space as it developed within the modern architectural movement at the beginning of the twentieth century. Instead, he argued for replacing the term 'space' by that of 'place', because for him space was *'an abstraction. It is only when we see space as a place where it's good to be that we have included man in the concept of space. So you could call space in*

²⁰⁵ According to the absence of an (aesthetic) reference to space in itself, in Van Eyck's writings there is no reference to be found to the art-scientific examination of space and space formation. He seems not to have been aware of this discourse, despite or perhaps just owing to his close relationship with Sigfried Giedion, and particular with his wife (both former students of Heinrich Wölfflin). Via Cornelis Van Eesteren, with whom Van Eyck was closely related as soon as he had started to work at the Public Works Department of the city of Amsterdam, in October 1946, he would have had the chance to get to know more about that discourse. Because, during his stay in Germany in 1922, Van Eesteren became - among others - acquainted with Herman Sörgel and definitely knew his book *Architectural Aesthetics*. For more detailed information about the connection of Van Eesteren to the German architectural debates at the beginning of the 1920s see: Franziska Bollerey, *Cornelis van Eesteren. Urbanismus zwischen 'de Stijl' und C.I.A.M.* 1999.

the image of man 'place'”²⁰⁶ Nevertheless, it makes very much sense to investigate this replacement of space by place, from a *space-forming* perspective, since his specific approach to space did not prevent a clear although implicit reference to space formation, to the enclosing, the opening and the arranging of inside- and outside spaces in relation to one another.

Next to rightly identifying the approach to (architectural) space of the Neues Bauen, and the included predominant preference for spatial openness and interpenetration, with focusing on space in itself, Van Eyck traced back this approach to a specific rationality or way of thinking, an ‘... *euclidean or classical way of thinking*’.²⁰⁷ He declared this thinking as to be fundamentally wrong, since for him it largely abstracted from the immediateness of reality, from the realm of immediate experience, from intuition and imagination. Against it he opposed an alternative thinking. It is a thinking that just starts from and centres on experience, on intuition and imagination, and from which the principal replacement of space by place is one essential element or rather result, as is the principle unity of space and time. In developing this approach, Van Eyck directly referred to three different sources: the avant-garde movement at the beginning of the twentieth century, the French philosopher Henri Bergson (1859-1941), and the Austrian-Israeli philosopher of religion Martin Buber (1878-1965). Concerning the avant-garde, he particularly referred to various artists in the field of literature and visual arts, like Andre Breton and Guillaume Apollinaire, Constantin Brancusi or Piet Mondrian and Theo Van Doesburg. Their work he identified with the same fundamental new way of thinking, and as to having opened up this perspective together with a corresponding development in philosophy and natural science. For Van Eyck this new thinking, or perspective, particularly crystallised in the term ‘relativity’.

At the same time, his specific experience-oriented approach to space (and time) was not at all linked to the avant-garde, as for instance to Theo van Doesburg’s approach and conception of space.²⁰⁸ In this regard, Van Eyck referred to Bergson and Buber, that is, to Bergson’s notion of time as ‘*durée*’ and Buber’s ‘*dialogisches Prinzip*’ (dialogical principle). For a great deal, his approach to (the human relation of man to) space is indeed based on a direct reference to both philosophical concepts.

²⁰⁶ Van Eyck [1961] 2008, 296. In the early 1980s Van Eyck corrects his categorical rejection of the term space and its replacement by the term ‘place’. See: ‘Transparency’, in: Van Eyck 2008, 494-96. However, also then an explicit aesthetic reference to space, acknowledging the object-like character of architectural space still is not to be found.

²⁰⁷ Van Eyck [1959] 2008, 199.

²⁰⁸ Compare: Chapter 3, 3.2 László Moholy-Nagy and Theo van Doesburg.

Despite the different nature of Bergson's and Buber's philosophical concepts, a general similarity between both - and what seems to have made them so attractive for Van Eyck - is their common focus on the perspective of the subjective human being: in the case of Bergson, the perspective of immediate perception and experience; in the case of Buber, the perspective of immediate mental belonging and identification.

Since from the reference to Buber a certain deepening of the reference to Bergson develops, Bergson's philosophical concept: his notion of time and the underlying focus on the concept of intuition, will be explained first.²⁰⁹ In order to additionally classify the specificity of Van Eyck's view within Team 10, his position is compared with Alison and Peter Smithson's and Jaap Bakema's perspectives. Particularly in relation to them this specificity may be illustrated. Finally his approach to space is compared to that of Gropius, and that of Schmarsow.

5.1 'Interiorizing' Space and Time

Following Francis Strauven, Van Eyck applied himself studying Bergson's concept, or rather theory of time at the beginning of the nineteen- fifties. Indeed, with his concept of 'interiorization' both of time and space, developed in the early sixties, Van Eyck particularly adopts Bergson's concept of time, although he eventually transforms his conception by transferring it onto space, or space-time.²¹⁰

²⁰⁹ The depth of my explanation of Bergson's theory is determined by the primary aim to understand and to evaluate Van Eyck's reference. Therefore, I confine myself to explain the essential content of his theory, leaving any theory-historical classification and critical discussion aside.

²¹⁰ Even though Van Eyck clearly adopted Bergson's concept of time, he interestingly nowhere explicitly mentioned this direct reference. The only clear reference to Bergson was not at all related to this conception. We find it already in Van Eyck's contribution to the official report of the CIAM meeting in Bridgewater, in 1947. Here, he takes over a quote from Carola Giedion-Welcker, who herself mentioned this quote in an article on Guillaume Apollinaire, in order to point to Bergson's influence on him: '*Ob nun Materie, ob Geist, die Wirklichkeit erscheint als eine stete Verwandlung, sie wird, oder sie entwirrt, sie ist nie ein fertig gewordenes*'. (Giedion-Welcker, [1942] 1973, 192.) But also in general terms, this reference is relevant for Van Eyck's experience-oriented concept of space only in a very indirect way, since it rather points to the not closer defined idea of reality as to be determined by continuous change.

Durée – Bergson's concept of time

Bergson's concept of time, conceiving time as 'durée' (duration), forms the keystone of his specific philosophy of life, and by which he became one of its main protagonists at the end of the nineteenth century. Generally speaking, the intention of that philosophy - and what already indicates a certain similarity between Bergson and Van Eyck - was to challenge the philosophical establishment and its, as Karl Albert puts it, '*bias for logical, epistemological and theoretical scientific issues*' and a corresponding '*positivistic oriented philosophic-theoretical research*'.²¹¹ Instead, the concept of life had to become '*the discursive weapon of a new way of thinking, (...) in order to open up again the elementary and primal questions of philosophy as time, death, love, society, nature and god (...) yet also, in order to catch up with the specific issues raised by the general condition of the time*'.²¹² In this line, characteristic also of Bergson was to develop and to formulate his concept of time in contrasting juxtaposition to natural science and associated way of thinking. As Christina Vagt puts it: '*Bergson's theory of duration ... simply is the other, the to natural science complementary side, a method of conscious life, and to capture the realness, the actuality of corporeal-mental existence*'.²¹³

Accordingly Bergson's notion of time as duration is intrinsically tied to the concept of intuition, in turn, conceived in a fundamental difference to intellect, to analytic reasoning. For Bergson, duration represents real time because it is intuitively perceived; it is heterogeneous and implies the realm of immediate and inner experience. By contrast, a scientific notion of time, based on intellect on analytic reasoning, misses - according to Bergson - that level of immediate and inner experience. It is oriented towards the outer world, outside of consciousness and thus separated from inner being and experience.²¹⁴

²¹¹ Albert, 1995, 9.

²¹² Ibid, 10

²¹³ Vagt, 2014, 15.

²¹⁴ Although Bergson clearly distinguishes intuition from intellect and stresses the essential significance of intuition to reveal, and thus to represent '*a deeper layer of human insight*', he just as acknowledges the significance of the intellect. Because, despite the different meaning and significance he addresses to intuition and intellect, he regards them as to complementing each other. Also following Arslan Topakkaya (Topakkaya, 2007), Bergson defines both the nature of intuition and that of intellect in their interdependence and in their corresponding relationship to the third form of consciousness (or rather unconscious consciousness) which is instinct. Here Bergson explains intuition as a reorientation of the intellect to itself, initiated by the instinct. At the same time, he explains it as an instinct that has become aware of itself, without, however, to identify intuition with the latter. By contrast, Bergson argues: '*We do not lose a word on those who believe that our intuition would be*

For Bergson the distinction between these two notions of time is inseparably linked to a qualitative distinction between time and space, a dualism between both, as Alan Lacy points out.²¹⁵ As Bergson defines duration as real time and intrinsically tied to intuition, he just as ties intellect to space. Because matter - the subject to which the intellect is generally directed - is getting analysed by our consciousness first and foremost in its spatial appearance, as it is getting conceived as discrete 'objects' existing in space next to one another and simultaneously, thus time-independent. Owing to this intrinsic relation he draws between space and intellect, for Bergson the intellectual perception (concept) of time actually does not represent time at all, but rather integrates time into space: like matter - as soon as it is intellectually conceived - it gets by means of measuring and counting separated into a sequence of discrete moments of spatial events. 'Durée', however, is real time, because at the level of intuition time is conceived as a heterogeneous whole, as a continuous self-contained process, additionally uniting past, present and future instead of separating them.

Interestingly, Bergson exemplifies the qualitative distinction he draws between space and time (and between the corresponding connection with intuition and intellect) on the basis of the aspect of movement. As a spatial process, for him movement merely represents a sequence of changes in spatial position, a passed through space. As an experienced event in time, instead, movement turns into a self-contained act, an act that is intuitively experienced.

'Interiorized' time

As indicated above, Van Eyck primarily shares with Bergson his focus on and preference of intuition, and the corresponding challenge of a first and foremost rational and scientific-theoretical understanding of reality. What is more, Van Eyck adopts Bergson's notion of time as duration, including the explicit juxtaposition to a rather intellectual understanding of time:

Now the present should never be understood as the shifting a-dimensional instant between past and future or as a closed shifting frontier between what is no longer and not yet is, but as a temporal span experience, shifting in the continuum of consciousness where past and future converge. (...) It is when he experiences and participates fully, when his associative awareness

instinct or feeling. No line of what we have written suggests such a view, instead, in everything which we have written we claim the opposite, namely that our intuition is reflection'. (Bergson, 1948, 106. Translated by author)

²¹⁵ Lacy, 1989, 17.

*charges and extends perception, rendering it transparent and profound through memory and anticipation, that he becomes aware of duration, i.e. of temporal depth.*²¹⁶

In this sense, Van Eyck refers now to duration as ‘interiorised’ time, as ‘*broken up and made accessible*,’ as Vincent Lightelijn and Francis Strauven rightly remark.²¹⁷

However, and what has not been identified to this day with regard to his reference to Bergson’s philosophy: Van Eyck modifies Bergson’s approach, although he has never explicitly stated this himself. This modification is based on the fact that Bergson refers to duration as being intrinsically tied to a specific state or quality of consciousness, which is intuition. By so doing, he aims at defining duration as a specific quality of time, namely real since intuitively perceived and experienced time. Van Eyck, however - and although he also explains duration as a specific quality of time and its perception - focuses on duration rather in terms of being a qualitative part and parcel of personhood, of human identity. For him, in ‘interiorising’ time – ‘*in breaking it up and making it accessible*’ - man coincides, thus is in harmony with himself, he is ‘at home’:

*... as soon as man experiences duration he senses himself contained in time – included – and time contained in him. In coinciding with time, furthermore, he coincides with himself. There is then no difference between sense of duration and sense of being, not for that matter between these and the sense of present, for the present is experienced as extending into the past and the future; past and future are created in the present. Thus implies self-realisation. Yes, man is ‘at home’ in duration. But there is no room for him in ‘closed time’. In the abstraction of the consecutive instant man loses his sense of dimension and hence also his identity.*²¹⁸

For Van Eyck this harmony moves in the centre of interest. Correspondingly, also an ‘interiorization’ of time always implies this meaning to be, or to reach the state of being, in harmony with oneself. Furthermore, he reinterprets the term ‘duration’ by linking time and its ‘interiorization’ to the term ‘occasion’ - and what further underlines a shift from the perception *of* to the experience *in* time. It is an experience that at least potentially implies activity and interaction. Hence, in his reference to Bergson’s notion of duration Van Eyck eventually extends, and by so doing, turns this notion in the direction of both identity- and activity-related experience. The perception of time as such moves into the background. The playing child is perhaps the best example to illustrate what Van Eyck had in mind here.

²¹⁶ Van Eyck, [1962] 2008-b, 74.

²¹⁷ Van Eyck, 2008, 466.

²¹⁸ Van Eyck, [1962] 2008-b, 74.

‘Interiorized’ space

Conform this shift in focus from the sensuous perception of to the identity-related experience in time, also concerning his approach to space Van Eyck is not interested in the perception *of*, but in the identity-related experience *in* space. Consequently, he refers - different than Bergson - not to space as such but to place, that is to say, to a location or area where that experience takes place:

*If space allows people to be alive in it, it will ‘become’ place. Conversely if we succeed in allowing construction, form or material to ‘become’ place – an act of poetry and magic – people will know they are alive there and really appreciate ‘space’ as such. Space experience is thus the reward of place experience. (...) Place is the appreciation of space, that is how I see it.*²¹⁹

And as with regard to time, in the quality of being or rather providing place for experience, for Van Eyck space is ‘broken up and made accessible’, space is ‘interiorised’. Here he explicitly regards built space as merely one, although specific architectural way to enable this interiorization:

*A wall, a seat or some steps on which to repose, talk, wait or watch; a table around which people gather for an occasion, a balustrade, wall or lamppost against which one may lean and smoke a pipe, a door which allows one to tarry with dignity. All these things are not spaces as such but they constitute place in the most direct physical sense. They are tangible points of focus from which space is appreciated. Their experience value belongs to the body of space – to its place potential – but they are not space as such, although they impart a feeling of belonging, of being somewhere specifically.*²²⁰

But whether or not built space is involved, with his notion of space as place Van Eyck extends experience in time onto space. Inner time-related experience (occasion) gets linked to outer location, it is ‘spatialized’. As a consequence, place gets – as it were - ‘temporalized’: *‘places remembered and places anticipated dovetail in the temporal span of the present. They constitute the real perspective of space’*.²²¹ As also Francis Strauven remarks, for Van Eyck place is - as a matter of principle - charged with duration:

*Place, in order to be a space where man feels at home,’ so Strauven, ‘must also incorporate duration. It has to be a space which not only intermediates in-between here and there, but which induces a simultaneous consciousness of now and soon; a space which, like man himself, is imbued with memory and anticipation.*²²²

As for Van Eyck the current moment of experience integrates memory and anticipation, the ‘spatialization’ of that experience thus implies the integration of various

²¹⁹ Van Eyck, [1962] 2008-b, 67.

²²⁰ Ibid, 69.

²²¹ Van Eyck, [1963-67] 2008, 472-73.

²²² Strauven, [1994] 1998, 419.

places, having been experienced in past and present and are to be experienced in future. As a result, in his experience-oriented concept of space, Van Eyck refers to space as space-time, and to space-time as a synthesis of place and occasion—as an instantaneous synthesis of *various* places and related present, past and future occasions. What is more, those places imply different scales of space, of architectural as well as urban quality. Eventually, Van Eyck links such an all-embracing ‘interiorization’ of space and time to the term ‘labyrinthian clarity’, wishing to express that experience in space and time implies both to experiencing the multi-layered complexity of places and to simultaneously experiencing each place in its specific identity:

*I have spoken of labyrinthian clarity, conscious of the fact that this may sound paradoxical ... As soon as the labyrinthian impact is articulated by the instantaneous impact of places of real quality during the temporal span implied, rendering it comprehensible as a single complex impression when experienced several times, one can justly speak of labyrinthian clarity. Labyrinthian clarity implies consecutive impression simultaneously sensed through repeated experience. It implies that clarity of place articulation grows – should grow at least in time.*²²³

On the one hand, Van Eyck separates such an all-embracing ‘interiorization’ of space and time from the sensuous perception of space, or three-dimensionality:

*Insofar as real experience, simultaneous and consecutive, constitutes a network of emotional and intellectual associations, it links – through the interaction of memory, actuality and anticipation – places and occasions in time and space far beyond the scope of immediate visibility and sensory perception.*²²⁴

On the other hand, however (and interestingly in the same talk from which I quoted Van Eyck with the fundamental statement that ‘*space is an abstraction. It is only when we see space as a place where it’s good to be that we have included man in the concept of space*’), he nevertheless pays attention to the experience of infinite spatial extension and that of enclosing. Moreover, he regards them as the two fundamental kinds of spatial sensation of man. As he put it: ‘*There is the spatial sensation, which makes us envy birds in flight; there is also the kind that recalls the sheltered enclosure of our origin*’.²²⁵ Hence, and whether consciously or not, Van Eyck eventually integrates into the concept of an ‘interiorization’ of space and time the perception of space, at least in terms of the sensation of spatial enclosure and openness, or infinitive extension. But consequently he talks about sensation thus inward-oriented perception.

²²³ Van Eyck [1962] 2008-b, 100.

²²⁴ Ibid, 76.

²²⁵ Van Eyck [1961] 2008, 296, 301.

5.2 Place, Experience, and In-between

Next to the explained reference to Bergson's concept of time, Van Eyck's experience-oriented concept of space is based on a reference to Buber's 'dialogisches Prinzip' (dialogical principle), particularly referring to the concept of 'Zwischen' (Between). Here, both references complement each other in a specific way: They complement each another, as the reference to Buber's concept of 'Zwischen' fills, so to speak, the concept of an 'interiorization' of space (and time) with a socio-spatial content and the term 'place' thus acquires a socio-spatial meaning. Before this, in my opinion, also new clarification of Van Eyck's use and linking of concepts is dealt with, Buber's theory is explained, as in the case of Bergson.

I and You: Buber's dialogical principle

Buber's 'dialogisches Prinzip,' particularly the relational concept of 'Zwischen' (Between), represents a central constituent of his 'anthropological' philosophy.²²⁶ The essential ambition of this philosophy was to reveal the 'essence' of personhood, by tracing this philosophic-ontological problem back to the anthropological question about the mental existence of man in the world—the mental existence of the individual human subject in relation to nature and to other human beings, and eventually to God. This existence he defines as being determined by the following principle and the twofold nature of man: On the one hand, and by virtue of (the evolutionary development of) their mind, Buber sees humans as mentally taking distance from the world, primarily from nature and, in the course of history, also from one another and from god. For Buber, this distance is determined by our consciousness and the implied recognition to exist as an independent person (as ego), which finds its expression in the personal pronoun 'I'. Owing to the intrinsic relation to man's evolutionary

²²⁶ To explain both the principle and the concept, I refer to three of his main texts (to which Van Eyck and other members of Team 10 also referred): *Ich und Du* (I and Thou) from 1923, *Das Problem des Menschen* (The Problem of Man) from 1943, and *Urdistanz und Beziehung* (Primordial Distance and Relation) from 1950. As with Bergson, the depth of my examination of Buber's philosophy is determined by the primary aim to understand and to evaluate Van Eyck's reference to him. Therefore, in the following I again restrict myself to explaining the essential content of the mentioned theory and concepts, leaving aside any critical discussion. For such a discussion, see: Theodor W. Adorno: *Jargon der Eigentlichkeit*, 1964; Siegfried Kracauer: *Die Bibel auf deutsch*, 1967; Emmanuel Lévinas: *Martin Buber and the Theory of Knowledge*, 1977.

‘Menschwerdung’ (incarnation), Buber defines this distance as ‘Urdistanz’ (primordial distance). By mentally creating this ‘distance,’ the individual human subject frees itself, unlike animals, from the surrounding world, which now turns out to be a counterpart, a vis-à-vis, an object-like world, which, says Buber, we consequently refer to as an ‘It’ world. Here the ‘It,’ or the ‘I–It’ relationship—since for him the self-awareness as ‘I’ principally implies the conception of the world as ‘It’—still expresses a certain relationship with the world. It is a relation that is limited to the realm of experience. It is regarded as a limited realm, since *‘the man who experiences has no part in the world. For it is ‘in him’ and not between him and the world that the experience arises. The world has no part in the experience’*.²²⁷ Therefore, Buber believes us humans not to create a *real*, an immediate relationship with the world as long as we exclusively experience the world as ‘It’. Moreover, he believes us to remain alienated from the world as long as we regard it as an ‘It’ world.

On the other hand, however, Buber assigns man the (just as inborn) nature to establish that immediate relationship: By going beyond the realm of experience, this relationship allows us to realise an immediate and specific relation *with* the world, and correspondingly counteracts man’s alienation from the world. In this immediate relationship, we (potentially) refer to the world as ‘You,’ and not just to other human beings, as Buber explicitly points out, though in our relationship to other humans *‘what confronts us has blossomed into the full reality of the Thou’*.²²⁸ Contrary to the ‘It,’ the ‘You’ (the ‘I–You’ relationship) expresses our subjective identification, our dedication to and communion with the vis-à-vis, with the world, and eventually with God, as the origin and condition of both our (mind-oriented) existence and that of the world. It simply distinguishes us, according to Buber, as being human. Eventually, Buber claims that both the ‘I–It’ and the ‘I–You’ relationships have to complement each other as the two principle modes of our conditionality in the world and as determining the essence of personhood.

Thus far, according to his diagnosis, the history of mankind has been however characterised by a progressive disappearance of the ‘I–You’ principle, of the forming of an immediate relationship with the world. Instead, *‘the history of the individual and that of the human race, in whatever they may continually part company, agree at least in this one respect, that they indicate a progressive augmentation of the world of It’*.²²⁹ To bring the relation between man and world in balance, he therefore pleads for strengthening the ‘You’ principle, or to revitalise it as far as it is conceived as having been lost. First and

²²⁷ Buber, [1923] 1962, 81. Quoted from the translated edition, Edinburg, 1937, 5.

²²⁸ Ibid, 148. Quoted from the translated edition, Edinburg, 1937, 103.

²²⁹ Ibid, 102. Quoted from the translated edition, Edinburg, 1937, 37.

foremost he does so with regard to inter-subjective relationships between human beings themselves.

Buber's concept of 'Zwischen'

Specifically regarding inter-human relationship, Buber identifies the 'I-You' relation with the term 'Zwischen' (Between), to be understood as a mental sphere that comes into being as soon as two persons really turn towards each other and perceive each other as 'You,' and not as 'It,' as him or her, and correspondingly suspend any distance separating them. That 'Zwischen' is ...

... ever and again reconstituted in accordance with men's meetings with one another (...) In a real conversation (that is, not one whose individual parts have been preconcerted, but one which is completely spontaneous, in which each speaks directly to his partner and calls forth his unpredictable reply), a real lesson (that is, neither a routine repetition nor a lesson whose findings the teacher knows before he starts, but one which develops in mutual surprises), a real embrace and not one of mere habit, a real duel and not a mere game—in all these what is essential does not take place in each of the participants or in a neutral world which includes the two and all other things; but it takes place between them in the most precise sense, as it were in a dimension which is accessible only to them both.

... In the most powerful moments of dialogic, where in truth 'deep calls unto deep,' it becomes unmistakably clear that it is not the wand of the individual or of the social, but of a third which draws the circle round the happening. On the far side of the subjective, on this side of the objective, on the narrow ridge, where I and Thou meet, there is the realm of 'between'.²³⁰

With regard to the personal pronouns of 'I,' 'It,' and 'You,' Buber refers to the sphere of 'Zwischen' as an integral part of man's natural identity and of the essence of personhood. In this sense, he distinguishes the 'Zwischen' from mistaken references to man and humanity as having been developed in Western philosophy until the present age. This is because, for him, these references have pointed either to individualism or, in contemporary times and opposite direction, to collectivism. He contrasts both individualism and collectivism with the concept of 'Zwischen,' since only this principle does

²³⁰ Buber, [1943] 1962, 405–06. Quoted from the translated edition of *Was ist der Mensch*, London, 1947, 141–43.

*...no longer localise the relation between human beings, as is customary, either within individual souls or in a general world which embraces and determines them, but in actual fact between them.*²³¹

Therefore, for him the concept of ‘Zwischen’

*shows the way, leading beyond individualism and collectivism, for the life decision of future generations. Here the genuine third alternative is indicated, the knowledge of which will help to bring about the genuine person again and to establish genuine community.*²³²

As the essential element of his ‘dialogischen Prinzips,’ Buber primarily refers to the term ‘Zwischen’ in connection with inter-human relationship. Next to this (and next to the implied religious connotation), he refers to the concept of ‘Zwischen’ in a second respect, namely the so-called ‘Gestalt gewordenes Zwischen’ (in a shape materialised between). Here he particularly identifies a work of art as the ‘*condensation of the relationship of man with the world*,’²³³ and as the result and expression of the same twofold ‘I–It’ and ‘I–You’ relation to the world—to move away from it as well as to relate oneself to it in an immediate way. In this sense, he describes, for instance, music as the continuous interplay between ‘*the distant discovery of tonal existence and its beziehungshafte*’ release into formed appearance’.²³⁴

Van Eyck’s notion of the ‘in-between’

Van Eyck adopts the concept of ‘Zwischen’ as an alternative conception of personhood that focuses either on individualism or on collectivism. Here he completely follows Buber’s criticism and his valuation of the concept of ‘Zwischen’ as the necessary alternative for both:

*Modern individualism is an imaginary structure – this is why it fails. Collectivism is the final barrier man has thrown up against himself to substitute. There is only one reality between real persons – what Buber calls ‘the real third’... not something that happens to one person or another person separately and a neutral world containing all things, but something that happens between both in a dimension only accessible to both. The in-between acquiring form. ‘On the other side of the subjective, on this side of the objective, on the narrow borderline where I and you meet lies the in-between.’*²³⁵

²³¹ Buber, [1943] 1962, 241.

²³² Ibid, 405–06.

²³³ Buber, [1950] 1962, 418.

²³⁴ Ibid, 418.

²³⁵ Van Eyck, [1961] 2008-b, 56.

At the same time, as with his reference to Bergson's notion of 'durée,' Van Eyck transforms Buber's concept of 'Zwischen'; again, he transforms it from a non-spatial to a spatial concept. From the perspective of his experience-oriented concept of space, this transformation complements his notion of 'interiorization'. In this respect, it particularly fills the term 'occasion' with a social or rather socio-psychological content, both in terms of immediate human interaction and in terms of the relation of man to the world.²³⁶ With regard to the latter, and taking the beach as an example, the borderline between land and ocean turns into an 'in-between' realm, a meeting point of land and ocean. In the paragraph titled '*Our natural Affinity with the In-between,*' he accordingly argues in *The Child, the City, and the Artist*:

*Take off your shoes and walk along a beach through the ocean's last thin sheet of water gliding landwards and seawards. You feel reconciled in a way you wouldn't feel if there were a forced dialogue between you and either one or the other of these great phenomena. For here, in-between land and ocean – in this in-between realm – something happens to you (...) you coincide with both, because their coincidence is you.*²³⁷

This transformation of Buber's concept of 'Zwischen' represents a first concretisation of what one might think of as being the experience of place, as it represents a foundation of its ontological meaning—in the example of the beach, the experience of departing and homecoming.

In concrete architectural terms, the 'Zwischen' turns into an architecturally created 'In-between'. The most prominent example of this is the threshold or 'doorstep,' the spatial zone between inside and outside. As an 'in-between' place—and similar to the borderline between land and ocean—the 'doorstep' also establishes, or should establish, a dialogue. Now this dialogue is the socio-spatial relation between private inside and public outside of the house. In his Otterloo talk in 1959, Van Eyck accordingly argued:

There is one more thing that has been growing in my mind since the Smithsons uttered the word 'doorstep' at Aix. It hasn't left me ever since. I have been mulling over it, expanding the meaning as far as I could stretch it. I have gone so far as to identify it as a symbol with what architecture

²³⁶ Owing to Buber's clear connection of experience with the 'I-It' relation of man to the world, and the corresponding separation between experience and the concept of 'Zwischen', Van Eyck's transformation seems to imply a fundamental contradiction with Buber's argumentation. However, the English term 'experience' unites two different terms in German—'Erleben' and 'Erfahrung'. While 'Erleben' implies a certain degree of activity and an orientation to the outside, 'Erfahrung' implies perception in terms of an inner reflection. Buber exclusively uses experience in the latter meaning. Van Eyck uses experience without to distinguish between 'Erfahrung' and 'Erleben'. Furthermore, one could question Buber's strict connection between 'Erfahrung' and the 'I-It' relation with the world, since the 'Zwischen' also is an experience in terms of 'Erleben'.

²³⁷ Van Eyck, [1962] 2008, 56.

*means as such and should accomplish. To establish the 'in-between' is to reconcile conflicting polarities. Provide the place where they can interchange and you re-establish the original dual-phenomena. I called this 'la plus grande réalité du seuil' in Dubrovnic. Martin Buber calls it 'das Gestalt gewordene Zwischen'. Take an example: the world of the house with me inside and you outside or vice versa, there is also the world of the street – the city – with you inside and me outside or vice versa. Get what I mean: two worlds clashing, no transition. The individual on one side, the collective on the other. Between the two, society in general throws up lots of barriers, whilst architects in particular are so poor in spirit that they provide doors two inches thick and six foot high (flat surfaces in a flat surface of glass as often as not.) ... Every time we pass through a door like that, we are split in two – but we don't take notice anymore. Is that the reality of a door? What then is the greater reality of the door? Well perhaps it is the localised setting for a wonderful human gesture: conscious entry and departure. That's what a door is: something that frames your coming and going, for it is a vital experience for those that do so but also for those encountered or left behind. A door is a place made for an occasion that is repeated millions of times in a lifetime between the first entry and the last exist.*²³⁸

Leaving aside that Van Eyck in his reference to Buber goes beyond Buber's own understanding of what 'Gestalt gewordenes Zwischen' means,²³⁹ this quote well exemplifies that Van Eyck conceives the designed inside-outside relation as an immediately experienced relation, constituted by the experience of coming and going. In this context, space in itself, even as an 'in-between' realm, does not have any value. It is the identity-related experience of belonging and of encounter what counts: *'the encounter between the worlds - two areas, the encounter between me and the outside world, the encounter between me and the fellow human being'*.^{240 241}

²³⁸ Van Eyck, [1961] 2008, 204.

²³⁹ Instead of referring to it as an artistic examination of man with the material world and with nature, Van Eyck turns 'Gestalt gewordenes Zwischen' into a built equivalent of the intersubjective 'Zwischen'.

²⁴⁰ Forum 1960 3, 265, 266.

²⁴¹ In the latter sense, Buber himself had already linked his concept of 'Zwischen' to architecture. In this respect, Georges Teyssot points to Buber's foreword in Erwin Anton Gutkind's *Community and Environment* (1953): 'A discourse on Social Ecology', where he states that *'The architects must be given the task to build for human contact, to build an environment which invites human meetings and centres which give these meetings meaning and render them productive'*. (Teyssot, 2013, 158.)

Alison and Peter Smithon and Jaap Bakema: Two different perspectives on the 'doorstep' and its experience- related meaning

In comparison with Van Eyck's notion of 'in-between', in the understanding and use of the 'doorstep' concept by Alison and Peter Smithon (to which Van Eyck refers above), we find a different reference to the realm of experience and that of identity. It is a reference that is less determined by a philosophical perspective than by a sociological one. Since its introduction at the ninth CIAM meeting in Aix-en-Provence in 1953, the Smithsons identified the 'doorstep' as a collective realm of concrete social interaction belonging between various private realms and the public realm. Referring in that specific presentation in Aix to the 'traditional' and existing streets in the working-class area Bethnal Green in London, they identify the 'doorstep' with the potential to generate a lively neighbourhood with spaces for play and communication, which is, in turn, related to the quality of generating the feeling of belonging and social identification with that neighbourhood.

*In the suburbs and slums the vital relationship between the house and the street survives, children run about (the street is comparatively quiet), people stop and talk, dismantled vehicles are parked. In the back gardens are pigeons and so on, and the shops are round the corner: you know the milkman, you are outside your house in your street.*²⁴²

In this sense, as Dirk van den Heuvel also points out,²⁴³ the Smithsons refer to that quality of generating a vital relationship in the sense of creating a social or socio-cultural identification of the occupants with their neighbourhood, as well as with their relative position within. It is an identification which for them develops from inside out, from private dwelling to (semi-)public street, and which is embedded in the routines of daily life. Accordingly, they argue:

*We should then consider the first point of contact outside the dwelling here children learn for the first time of the world outside the home and here are carried on those adult activities which are essential to everyday life, for instance, shopping, making minor repairs, posting letters, cleaning the car, or exercising the dog.*²⁴⁴

Though Van Eyck also refers in his interpretation of the 'doorstep' to the creation of a place for human encounter, and though his concept certainly does not stand in

²⁴² Alison and Peter Smithson, *Ordinariness and Light*, 1970, 45. Quoted from Highmore, 2010, p. 18. Later, this approach is architecturally elaborated in the concepts of 'street in the air' and 'yard-gardens', both of which should help transfer that quality of lively neighbourhood into the condition of post-war society. For a more detailed discussion, see: Van der Heuvel, 2012.

²⁴³ Van der Heuvel, 2012, 83.

²⁴⁴ Alison and Peter Smithson, 1982, 8–9. Quoted from Van den Heuvel, 2012, 83.

contradiction to such an explicit socio-spatial perspective, he rather concentrates on the moment of subjective experience and on man in its fundamental existence in time and space.

Opening up a third perspective on the concept of the ‘in-between’, Jaap Bakema significantly expands and generalises the context of experience and belonging, within which the ‘doorstep’ as a built ‘in-between’ is seen as a realm that helps to generate that belonging.²⁴⁵ Here he places the individual human subject and the issue of home and belonging in the most extended context one can imagine: the universe—in the words of Bakema, ‘*the infinitive space with earth, wind and stars*’. The reason for this is that, for Bakema, in this ‘*infinitive space, man has to establish his home in order to have the potential to exist*’.²⁴⁶ Bakema connects this potential with the principle desire of man to experience and realise his particular existence within that universe. But despite the absolute nature of the context to which he refers, Bakema brings the rather existentialistic positioning of man within that context back to the socio-spatial relation between house and street, by asking:

*How long it will take, before we know that the shaped transition between inside- and outside space meets the elementary human need to experience, again and again, the gradation from his birth in the enclosing body until the flying into the continuously extending universe?*²⁴⁷

Here he interestingly assigns space formation the function of physically shaping and giving expression to that existential relationship of man to his far extensive environment. By so doing, Bakema means that architecture should help man ‘*in his quest for a good relationship with the wonder of being*’.²⁴⁸ In this sense, ‘*each space that is formed by constructions, could be a human attempt to reach a better understanding with the surrounding space*’.²⁴⁹

In comparing all the three references to the notion of ‘in-between’, Van Eyck’s approach is to be positioned somewhere in between the Smithsons’ and Bakema’s view. He does not refer to the ‘in-between’ or to the realm of experience in such concrete socio-spatial terms as the Smithsons do, nor does he use such fundamentally existential terms as Bakema does. Rather, concerning both the natural ‘doorstep’ materialised in the beach and the architectural ‘doorstep’ materialised in the entrance

²⁴⁵ This perspective is especially found in his publications from the early 1960s: *Building voor the anonymous client*, 1962, *Van stoel tot stad*, 1964, and *Naar een samenlevingsarchitectuur*, 1964.

²⁴⁶ Bakema, 1964a, 1.

²⁴⁷ Bakema, 1964b, 18. Interestingly, Bakema refers, whether deliberately or not, to the same two basic forms of human spatial sensation as those identified by Van Eyck.

²⁴⁸ Bakema, 1964 a, ...

²⁴⁹ Bakema, 1964b, 14. For a more detailed discussion, see: Francis Strauven, 1998. Strauven qualifies his reference to the universe as a theosophical concept of space (Strauven, 1998, 217).

of a house, he conceives the ‘in-between’ as a universal phenomenon and points to the quality of this phenomenon to represent a realm of immediate (socio-spatial) experience—a realm where opposed elements are united in the concrete experienced state of interrelation. He focuses on the moment of experience and links this to man’s fundamental existence in space and time, to personhood.

By focusing on the immediate and subjective experience in space, Van Eyck principally argues at a philosophic-theoretical level, and consequently aims at revealing fundamental principles. Besides the experience-oriented approach to space, that is, the ‘interiorization’ of space and time, another principle is the coincidence of architecture and man, which in turn is embedded into a coincidence of architecture, man, and the principle of relativity. Van Eyck conceives the latter as the most fundamental principle of the whole material and immaterial world. Although both demanded principles actually lie beyond Van Eyck’s experience-oriented concept of space and already touch the subject of the following Chapter: ‘Van Eyck’s (implicit) reference to space formation,’ they are also discussed here. This is because both imply a further classification of the notion of ‘in-between’.

5.3 The Fundamental Coincidence of Architecture and Man

Designing in accordance with the (human) ‘interiorization’ of space and time, framing and enabling this ‘interiorization’ by creating ‘in-between’ places or rather spaces, for Van Eyck architecture (and urban design) turns into humane architecture. Just then, for him, architecture coincides with man since it coincides with his fundamental existence in space and time. The aforementioned fundamental kinds of spatial sensation are included here and even take centre stage. In his famous ‘breathing both in and out’ aphorism, demanding an architecture that, like humans, also should breathe both in and out, he argues:

There are two fundamental kinds of spatial sensation that are compatible with man’s primordial nature. They must always been present somehow in what we make - both at once. That is why I have conjured the breathing image and keep asking: when is architecture going to breathe in and out - i.e. just breathe. There is the spatial sensation, which makes us envy birds in flight; there is also the kind that recalls the sheltered enclosure of our origin. (...) The in-between realm provides for both aspects simultaneously.²⁵⁰

²⁵⁰ Van Eyck, [1962] 2008-b, 67.

In this sense, and as has been concluded above,²⁵¹ Van Eyck's experience-oriented concept of space, the 'interiorization' of space, includes the element of a human *sensation* of space, or rather enclosure and openness. Moreover, for Van Eyck these spatial sensations play a significant role concerning the question *how* architectural design is practically related to that 'interiorization' of space (and time) and to the creation of 'in-between' places. Interestingly, and demanding, as quoted above, both kinds of sensation to be always '*present somehow in what we make*,' Van Eyck essentially aims at space formation, that is, at the relation between creating physical enclosing and protection on the one hand, and spatial opening and outside orientation on the other. It is this reference to both, and in mutual relation to each another, that characterises his (implicit) reference to space formation, and how he eventually integrates space formation in his experience-oriented concept of space, in the 'interiorization' of space and the corresponding creation of 'in-between' places.

According to Georges Teyssot,²⁵² this analogy between breathing human beings and breathing architecture particularly reveals the mimetic approach that would characterise Van Eyck's argumentation.²⁵³ In my opinion, and without wishing to evaluate Van Eyck's reference to the term 'breathing', it is not the moment of mimesis (in the sense of imitation) that characterises Van Eyck's reference to human breathing. Rather, in line what has been explained above, Van Eyck uses the term 'breathing' as a metaphor: a metaphor that symbolises the principal demand to design in accordance with what he regards as the fundamental relation of man to space. This congruence is what he, in turn, conceives as being embedded in a congruence of architecture, man, and what will be discussed in the next paragraph: the fundamental principle of reality as a whole, that is, the principle of 'relativity'. He finds this congruence, for instance, in the traditional culture of the Dogon people and regards it as being both primordial and of timeless meaning, which thus is to be restored in the condition of modern times.

²⁵¹ See: Paragraph 5.1 'Interiorizing' Space and Time.

²⁵² Teyssot, 2013, 158–160.

²⁵³ Teyssot argues: '*... for Van Eyck, a building should present a structural analogy to the human being (...)* For Buber, as for Van Eyck, while man is made in the image of God, space is made in the image of man. Accordingly, architecture functions in a system of imitation, with each level of similarity, or analogy, 'imitating' the next, from the scale of the theological to the anthropological'. (Teyssot, 2013, 160.)

5.4 Conclusion

Based on Bergson's philosophy, in particular his view on time, Van Eyck's experience-oriented concept of space first of all refers to space in terms of its 'interiorization', an 'interiorization' of space in unity with that of time. Architecture, including spatial design, is regarded as a means of framing and enabling such 'interiorization'.

Linking this concept to Buber's notion of 'Zwischen,' the experience *in* space and time becomes linked to the realm of inter-human and socio-spatial relations, and is thus substantiated in an ontological sense. By simultaneously extending Buber's notion to space, and particularly to architectural design, his 'Zwischen' becomes an architecture-spatial 'in-between'. Here this 'in-between' Van Eyck consequently relates to both establishing socio-spatial relations at various levels and enabling their experience.

Thus far, Van Eyck has not made any reference to the sensuous perception of space, or spatiality, itself. The perception *of* space rather dissolves into the notion of an all-encompassing 'interiorization' of space and time. It is the identity-related experience of belonging and of encounter what counts: *'the encounter between the worlds - two areas, the encounter between me and the outside world, the encounter between me and the fellow human being'*. At the same time, he also points to the perception of enclosure and openness. He does so, by referring to the *sensation* of enclosedness and infinitive extension as the two fundamental kinds of the spatial sensation of man. However, also this rather implicit reference to the sensuous perception of (architectural) space remains an intrinsic part of the 'interiorization' of space and substantiates its existential dimension.

In order to conclude the discussion of Van Eyck's experience-oriented approach to space, this approach still must be compared with those of Schmarsow and Gropius. In Chapter 3 I concluded that Gropius differs from Schmarsow in his understanding of the sense of self that forms the basis of his approach to (the perception of) space. I also pointed to the consequence for the general subject-object relation between man and architectural space. To recall the outcome of my analysis: Gropius, in contrast to Schmarsow, does not link the human sense of self to any kind of body-related constitution and perception of space. He apparently conceives the (sensuous) perception of space as to rather exist independent of the immediate physical-spatial context and the corporeal, that is, anatomic-physiological constitution of man's spatial perception within this context. Therefore, in Gropius's conception, the (sensuous) relation between human being and architectural space misses the experience of architectural space as something extending from one's own body, as it accordingly

neglects the aesthetic significance of the experience of architectural space as a (relative) enclosure of the perceiving human being. Moreover, perception is reduced to a pure mental mode of perception, while the sensuous perception of enclosure and inside orientation ‘disappears’ in the recognition of space as physically defined volumes or partitions of space. The sensuous perception of relative openness and outside-orientation ‘dissolves’ in the recognition of space as motion.

If we extend this comparison to Van Eyck, we see that he shares with Gropius the same lack of any reference to the realm of body-related perception or experience *of* space. Schmarsow’s anatomic-physiological approach, which integrates sensory perception and corporeal examination of space, is again ‘replaced’ by a purely psychological concept that takes an inner feeling, or experience, as the very point of departure. The difference between both psychological concepts is that in Gropius’s case sensuous perception turns into mental recognition and in Van Eyck’s case into (self-)experience.

At the same time, however, Van Eyck refers to the perception of space in concrete sensuous terms, although his reference to the sensation of enclosure and openness remains integrated into, thus subordinated under the experience not of but *in* space. In line with this difference between him and Gropius, Van Eyck does not refer to built space in terms of (abstract) volumes of space, as it characterises Gropius’s understanding. Instead, and as the next Chapter will show, the two essential elements of space formation—enclosing and opening plays a central role his approach to architectural design, as does the creation of (a dynamic or rather mediation between) enclosed spatiality and outside orientation.

Taking all this into account, we may specify three different approaches to (the perception of) space. Here the specific contradiction of Van Eyck’s approach is that, on the one hand, he acknowledges architectural space in terms of a (relative) enclosure of the perceiving human being. On the other hand, the conceived relation between man and space misses the notion of architectural space as an object of (sensuous) perception.

What then is the greater reality of the door? Well perhaps it is the localised setting for a wonderful human gesture: conscious entry and departure. That's what a door is: something that frames your coming and going, for it is a vital experience for those that do so but also for those encountered or left behind. A door is a place made for an occasion that is repeated millions of times in a lifetime between the first entry and the last exist'.

Aldo van Eyck, 1959

In whatever we make, the architectural reciprocity of unity-diversity and part-whole (closely linked twin phenomena) should to some extent at least cover the human reciprocity of individual-collective. Still, there are two more twin phenomena also closely linked to those just mentioned which still elude adequate translation into planning – a twin set: large-small and many few'.

Aldo van Eyck, 1962

6 ALDO VAN EYCK'S (IMPLICIT) REFERENCE TO ARCHITECTURAL SPACE FORMATION

In this Chapter, Aldo van Eyck's (implicit) way to refer to space formation is explained - again both in theoretical as well as practical terms. As for Gropius, this reference necessarily results from his overall approach to architectural design. In his case, however, this approach largely coincides with his experience-oriented approach to (the perception of) space. This is because for Van Eyck, the experience in space also represents the overall use-related and socio-spatial purpose of architectural design. Owing to the connection that principally exists between the way one refers to space formation and the overall approach to architectural design, also Van Eyck's kind of reference is connected with another constituent element of his overall approach to architectural design: a keen focus on the principle of 'relativity'. For him, this principle took a similar design-determining position as the Industrial Age did for Gropius. It represented the overall concept of reality in which architectural design and aesthetics must be integrated.

Therefore, as a continuation of the explanations of the previous Chapter, before revealing Van Eyck's (implicit) reference to space formation and exemplifying it on the basis of various designs, I will first focus on his examination of the principle of 'relativity'. Different to the descriptive character of this explanation, the analysis of his way to refer to space formation is—as in the case of Gropius—rather interpretative in nature. This results from the fact that also Van Eyck did not refer to architectural space formation in a direct and explicit way, although, for him the enclosing and opening of space played a significant role, as indicated above. What remains however at a rather speculative level, is—as in Chapter four with regard to Gropius—

underpinned and made concrete in the following analysis of Van Eyck's architectural work.

6.1 Twin Phenomena: A Particular Reference to the Concept of Relativity

As the subtitle of Francis Strauven's study on Van Eyck—*The Shape of Relativity*—already suggests, the concept of relativity played an essential role in Van Eyck's thinking.

Van Eyck refers to 'relativity' as the superordinate principle of the whole material and immaterial world, embodying the very essence of that world thus of reality as such. As a result, he defines 'reality' as a reality of relation. At the most general level, it is defined as a further undefined relation between time, space, matter, and energy. Although he acknowledges the fundamental difference between a cosmological and a human empirical dimension of reality, he conceives relativity to also determine the empirical reality of man. Taking 'relativity' as the all-dominant principle of the whole material and immaterial world (and by positioning himself in the tradition of the artistic avant-garde in the beginning of the twentieth century), according to Van Eyck, this principle must be both revealed and implemented at the level of human existence. Moreover, just at this level 'relativity' realises itself in an all-embracing since man including way. In this sense, for Van Eyck, the above-explained notion of the 'interiorization' of space and time also implements the concept of 'relativity' in a comprehensive way: it embodies not only the neutralisation of space and time as separate entities and conditions of physical reality, but as the two fundamental conditions of human existence.

Because the fundamental interiorization of space and time as contained in and represented by contemporary science, art, and philosophy tends still to escape understanding, in spite of the unquestionable humanisation of space and time implied by their interiorization (the continuity of their unity) and the clarity with which this has been expressed in almost every creative medium and field of thought, I thought it expedient to further charge space and time with what they have thus in fact already come to imply, but which is nevertheless, both by its very nature and the human immediacy of architecture, still so difficult to extend into constructed environment: place and occasion. I wish to evoke an understanding of both space and time in the image of man,

*conscious as I am of the fact that I am attributing to the notion of both the cold abstract meaning they have already lost.*²⁵⁴

Nevertheless, for Van Eyck the reality of human existence merely represents one layer of the overall reality of the whole material and immaterial world, although it is for him of essential significance. Thus, for him, the ‘interiorization’ of space and time indeed implements the relativity of space and time, but it does not explain relativity as such. In attempting to do so, Van Eyck generally identifies relativity as a reciprocal relationship between different phenomena in reality: ‘*Relations that are just as important as the things themselves*’ and that ‘*are at the same time autonomous and mutually relate,*’ as Francis Strauven points out.²⁵⁵ With regard to space and time, this means that both their identities are bound to their reciprocal relationship, which comes into its own, in turn, at the level of human experience. This definition of ‘relativity’—for defining the identity of any phenomenon of reality due to its reciprocal relation with another phenomenon—Van Eyck attempts to exemplify with the term ‘twin phenomena’. Here ‘twin phenomena’ basically implies that in various respects reality establishes itself as a reciprocal relation between two opposed phenomena, or rather between two phenomena that we are used to render as to be opposed to each other. As Strauven states, the ‘twin phenomenological’ opposites appearing in Van Eyck’s writings are:

*Multiplicity–unity, unity–diversity, part–whole, large–small, simplicity–complexity, constancy–change, many–few, inside–outside, open–closed, movement–rest, near–far... clear–labyrinthian, order–chaos, bounded–unbounded, microcosmos–macrocosmos, mass–space, time–space, energy–matter, past–future, organic–inorganic, subject–object, light–dark, body–mind, man–god, good–evil, male–female, imagination–reason, conscious–subconscious, outer–inner reality, head–heart and abdomen, dream–reality, myth–reality, romanticism–classicism, individual–collective, architecture–urbanism, house–city, old–new.*²⁵⁶

As Strauven also concludes,²⁵⁷ Van Eyck’s concept of twin phenomena implies a dialectical understanding of reality. In this understanding, he focuses on the very basic aspect of what is generally defined as dialectics, namely the unity of oppositions. However, he explicitly distinguishes his approach from what he rightly addresses as

²⁵⁴ Van Eyck, [1962], 2008-b, 48–49.

²⁵⁵ Strauven, 1998. In the scope of this dissertation, a theoretical–historical classification of this concept is left aside. Instead, this paragraph exclusively deals with the content of his particular concept of relativity. For a general theoretical–historical classification, see: Strauven, 1998, in particular: 73–87.

²⁵⁶ Strauven, 1998, 461.

²⁵⁷ Ibid, 458.

the dialectics of Hegel²⁵⁸ and underlines that the kind of unity he has in mind is not something ever reached by the neutralisation of an opposition at a higher level. Instead, he refers to opposition as a timeless and unchanged relationship. And though Van Eyck's concept of 'twin phenomena' also implies both the aspect of negation and its neutralisation—it does so by emphasising the *complementing* association between two opposed elements—their dialectical reconciliation in this way is neutralised as '*conflicting polarities*'.

In such a reconciliatory sense, however, the notion of 'twin phenomena' essentially represents a generalisation of Van Eyck's concept of the 'in-between', as explained in the previous Chapter. Indeed, '*to establish the in-between*,' to recall the aforementioned quote, for Van Eyck, means to '*reconcile conflicting polarities. Provide the place where they can interchange and you re-establish the original dual-phenomena*'.²⁵⁹ Consequently, referring back to the previous Chapter, with the discussion of the 'breathing' metaphor and Van Eyck's fundamental demand to bring architecture in coincidence with man, we see that the notion of the 'twin phenomena' embeds this congruence of architecture and man in the overall notion of reality as a condition of relativity.

With regard to architectural design, the 'twin phenomena', therefore, turns out to be the most essential and determining category to realise this congruence. Consequently, architectural design—including the creation of 'in-between' places—turns into the shaping of a 'twin-phenomenological' reality, as it were. Here the design-relevant twins mentioned by him are 'inside–outside' and 'open–closed,' with a clear (socio–) spatial significance, and 'part–whole,' 'large–small,' or 'diversity–unity' with a formal significance. The most general twin phenomena are those of 'architecture–urbanism'.

Owing to the fundamental significance he attributes to such 'twin-phenomenological' way of designing, the creation of 'in-between' places by means of the simultaneous enclosing (separating) and opening (relating) of space, gets complemented by other forms of designed twin phenomena. In this context, he notably includes the other fundamental realm of architectural design, which is tectonics, stating that '*the awareness of the in-between creeps into the technique of construction. It will transform not only our idea as to what we should make, but also as to how we shall make it—including our technical*

²⁵⁸ Van Eyck [1962], 2008, 426.

²⁵⁹ Van Eyck, [1961] 2008, 204. Here Van Eyck still uses the term 'dual phenomena', which he later, inspired by his first visit of a Dogon settlement in 1960, changes into the term 'twin phenomena'. Thus, he univocally emphasises the aspect of unity against that of contrast and separation.

approach. It will be there in the body, the members, and the joints of whatever we make'.²⁶⁰ However, and as it will be discussed and exemplified below, this also (potentially) leads to a superimposition of the creation of 'in-between' places.

With his conception of the so-called 'configurative design', Van Eyck also applied his 'twin-phenomenological' approach to urban design. Here the twin phenomena that he assigns as relevant for a corresponding urban design are: 'house-city', 'individual-collective', and 'architecture-urbanism'. However, and as the named twin phenomena already indicate, at the level of urban design, Van Eyck's 'twin-phenomenological' approach remains, in terms of design, quite conceptual and abstract.

6.2 From Overall Approach to Architectural Work: Van Eyck's (Implicit) Reference to Architectural Space Formation

Just like Gropius, Van Eyck nowhere mentions the term space formation, neither in an artistic nor a use-related and socio-spatial sense. Nonetheless, the formation of spaces and spatial relations plays a central role in his approach to architecture, as he regards the enclosing and opening of space(s) as two essential instruments in creating 'in-between' places and thereby enabling a specific (socio-spatial) experience in space. This may be the relation of someone with a certain place, an intersubjective dialogue, or the relation between that place and the spatial environment. In this sense, his reference to space formation, just like his general approach to architectural design, directly follows from the experience-oriented approach to (the perception of) space, as explained in the preceding Chapter.

Van Eyck's (implicit) way of referring to (aspects of) architectural space formation has similarities with that of Gropius and the Neues Bauen in that it differs from the approach to space formation, which is to be found in the architectural theory of the nineteenth century and within the 'art-scientific' discourse as discussed in Chapter 2. There, the fundamental purposive function of space formation - to be realised by means of shaping a physical enclosure of space - was identified with the creation of protection and privacy. Regarding this difference, Van Eyck's approach is just as characterised by the orientation towards what is happening *in* space instead of focusing on space formation itself and which also implies a use-related 'backbonding' of architectural design. Different to the Neues Bauen, however, in Van Eyck's approach this 'functional backbonding' is no longer determined by the aspiration to

²⁶⁰ Van Eyck, [1962] 2008-b, 55.

design use itself, or ‘life processes’ as Gropius called it. For Van Eyck, the ‘interiorization’ of space now is the new fundamental use-related function of architectural design. Thus, his (implicit) reference to space formation differs from that of Gropius in that the socio-spatial meaning of space formation no longer gets neglected. In contrast, the function to create protection and privacy gets rather integrated in a further developed conception of the immediate socio-spatial meaning of architecture. Here the architectural realisation of protection and privacy changes to the experience and the living of both protection and open relation. Moreover, both become an integral part of a more extended and complex concept of the socio-spatial meaning of architecture.

On the one hand, from this perspective follows a clear appreciation of the creation of enclosed spatiality, and even the creation of an atmosphere of ‘enclosedness’. In this respect, Van Eyck also argues himself, in a talk given at the Royal Academy of Art in The Hague in 1961, that different to *modern* architecture that was ‘*fanatically engaged in making the inside into an outside*’, architecture has actually ‘*always been the creation of the inside, even if it is outside*’. He continues:

*Architecture is the creation of the interior for the individual, for a smaller group, for a larger group, or for a whole community. A city is the interior of the community. It is the complex living room of the community. At the same time, the city is the continuation of clothing. It starts with the naked body, then protective layers are gradually added for all sort of reasons: a shirt, trousers, jacket, wall, roof, street, square, city. Everything is included in the continuation of the clothing, in the fullest sense of the world.*²⁶¹

As a result of his particular ‘anthropological’ perspective that links the immediate experience in space with personhood, he traces the creation of interior—thus the experience of enclosed spatiality—back to the fundamental aspect of clothing. By so doing, one may suppose that he links enclosure in architecture and urban design with the purpose of providing protection, and the experiencing this protection, in a very immediate and existential way. He, however, refers to clothing in a more general way: as an element of well-being and of feeling comfortable. Correspondingly, he refers to clothing, certainly with regard to the city, in a figurative sense: ‘*To build a city for the community, where it is warm, where it is good to be, where one can actually live, ..., where one really has the feeling of being a proper human being*’.²⁶²

Hence, and in line with not mentioning the term space formation, Van Eyck does not explicitly link the quality of enclosure with the creation of enclosed spatiality, although it seems to be automatically included. In line with his experience-oriented

²⁶¹ Van Eyck, [1961] 2008, 300.

²⁶² Ibid, 301.

approach to space, he principally approaches the creation of 'interior' - thus enclosed spatiality - from the perspective of its experience and identity-related meaning. It is the psychological aspect of 'interiorization' that comes first, the architectural making of enclosed spatiality principally follows from this. Therefore, in his reference to enclosing, Van Eyck remains somehow in between the purpose-related meaning of providing protection and enabling privacy, on the one hand, and the aesthetic meaning to experience the 'interior' by experiencing one's own 'enclosedness', on the other hand. He clearly mentions neither the first nor the latter. Both are instead somehow integrated in the notion of 'interiorization'. Thus, also the socio-spatial purpose of the enclosing of space seems to vanish into the interiorization of space, as does the spatial sensation of enclosure.

But however Van Eyck refers to the creation of enclosed spatiality, he always does so in unity with the simultaneous opening of the space-enclosing shape, and the corresponding relating of the enclosed space to other spaces. In conformity with his 'twin-phenomenological' approach to architectural design, his reference to enclosing and opening is characterised by referring to them as an inseparable unity. This is because just in combination with its relative opening for Van Eyck any physical enclosing realises a real 'interiorization' of space, a real 'built homecoming'.

For Van Eyck, also the spatial arrangement of spaces forms a central element of architectural design, at least as soon as more than only one place is to be established. He, however, deals with the *configuration* of spaces, which is certainly inspired by his 'twin-phenomenological' concept of reality—particularly in connection with the twin phenomena 'part-whole' and 'diversity-unity'. By using the term configuration, his reference to the arrangement of spaces implies the idea that every arrangement of particular parts takes place within a comprehensive whole, or rather results in it. Furthermore, for Van Eyck, such configurative arrangement of spaces may imply a certain layering within that arrangement. As a result, the configuration of space gets potentially linked with the concept of a polycentric configuration of spaces. Owing to the fact that he principally links architectural design with the creation of 'in-between' places, also such configuration of spaces is intrinsically tied to the creation of 'in-between' places. As a result, and whether or not reflected by himself in this way, it is intrinsically tied to the enclosing and opening of space.

A twofold artistic reference to the notion of 'twin phenomena'

In this sense, the creation of 'in-between' places—by means of the enclosing and opening of space, of shaping enclosed spatiality in unity with outside orientation—

forms an integral part of Van Eyck's 'twin-phenomenological' approach to architectural design. Here the simultaneous reference to both enclosing and opening embodies the twin phenomena of 'inside–outside' and 'open–closed'. Other design-relevant twins that he describes are the already mentioned twin phenomena 'part–whole,' 'large–small,' and 'diversity–unity'. The difference between them and the two others is their primarily formal character. Hence, the space-forming and socio-spatial reference to the concept of 'twin-phenomena' is complemented by its interpretation and use as a formal design principle.

However, this twofold artistic reference to the concept of 'twin phenomena' potentially implies an artistic superimposition of the creation of 'in-between' places and its artistic effect. In particular, it does so at the level of spatial configuration and by the application of the twin phenomena 'part–whole' and 'diversity–unity'. This is because as far as it concerns architectural space formation, the artistic implementation of these two twin phenomena is first and foremost related to the spatial arrangement of spaces, which is the spatial configuration of rooms of same or different use and socio-spatial quality within a building and its spatial context as a whole. Yet, a configurational arrangement of spaces that deals with the building as a whole fundamentally differs from the creation of a particular 'in-between' place. The latter creates a socio-spatial meaning at the scale of a particular space. Although the design of an 'in-between' place in the shape of this space implies the relation between that space and the immediate spatial context, it primarily approaches this relation from the perspective of that particular space itself—and from the corresponding socio-spatial experience and identification. In contrast, a configurational arrangement of several spaces rather zooms out to the overall composition of the whole space-forming structure and takes an outer position. This is a position that lies outside any particular space or spatial zone and outside any particular experience in space. Therefore, the twin phenomena 'part–whole' and 'diversity–unity' are put into effect at the level of the overall spatial configuration of a building. Yet, since spatial arrangement, enclosing and opening are principally tied to one another in such a way that material enclosing and opening together transform the spatial arrangement of spaces into a configuration of real spaces, this particular 'twin-phenomenological' kind of design also affects the element of enclosing and opening. As it will be exemplified on the basis of the following analysis of buildings, a distinct superimposition of the artistic effect of the created (configuration of) 'in-between' places now depends on the extent to which the arrangement of spaces is formalised in accordance with the twin phenomena of 'part–whole' or 'diversity–unity'. This amounts to how far the reciprocity of 'part and whole,' as well as 'diversity and unity,' develops to a self-referential order—an order that takes on a life on its own.

Building analysis

Similar to the analysis of the various projects of Gropius, the following analysis of different buildings has the function to exemplify Van Eyck's (implicit) reference to space formation—this now includes the exemplification of its partial superimposition by the general implementation of a 'twin-phenomenological' approach to architectural design. This analysis first focuses again on the space-forming structure and on the corresponding kind of how spaces are defined and related to one another and to the surroundings. Therefore, each analysis is divided into and accordingly comprises three layers. First, there is (the analysis of) the overall configuration of inside and outside spaces and of their pure spatial arrangement. Also, there is (the analysis of) the way as to how the various inside-spaces are formed and related to one another along with how they are sized, separated from, and connected with one another. Furthermore, there is (the analysis of) the way as to how the inside-out relation between the inside and the surrounding outside of buildings is concretely shaped.

As a result, the structure of this Chapter is as the following: In the first part, the intention is to exemplify Van Eyck's (implicit) use of space formation as it results from his concept of the 'in-between'. This is done on the basis of a rather extensive analysis of the space-forming structure of the Orphanage in Amsterdam and the subsequent short analysis of the Pastoor Van Arskerk in The Hague and the Sonsbeek Pavilion in Arnhem. The second part deals with the rather formal implementation of Van Eyck's 'twin-phenomenological' design approach, which particularly characterises two office designs from the mid-1980s: the design for the extension of the ES-TEC building in Noordwijk, the Tripolis complex in Amsterdam. In a different way, it also characterises the design for the extension of the Court of Audit in The Hague. In all the cases, I deal with this approach in terms of how it is related to and influences the present kind of space formation and the present designing of (a configuration of) 'in-between' places by means of the enclosing, opening and arranging of spaces. Due to this direct linking between space formation and the creation of 'in-between' places, I use from now on the term 'in-between' *space* to express this identification.



36 Orphanage, aerial view from the north-west

37 Orphanage, groundfloor

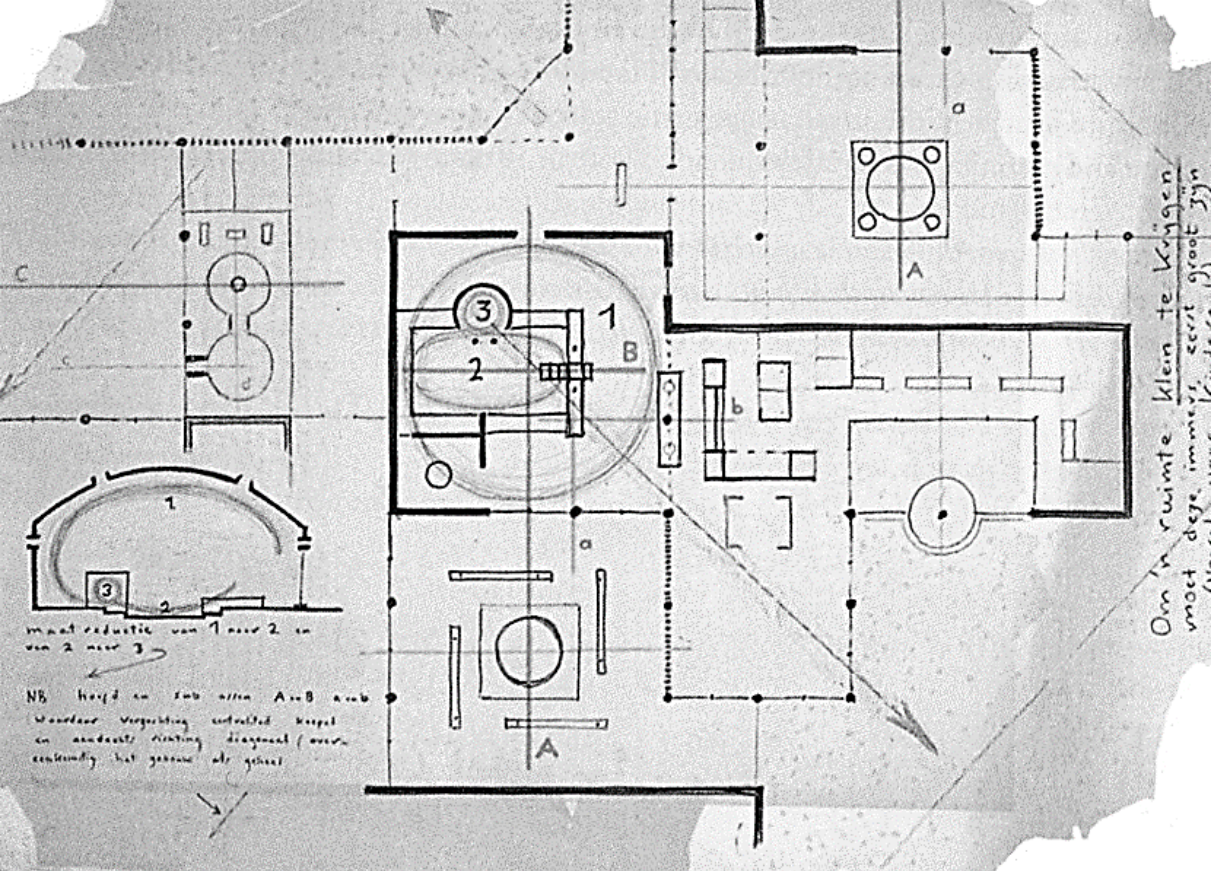


6.2.1 Orphanage, Pastoor Van Ars Church, and Sonsbeek Pavilion: Space Formation as the Designing of 'In-between' spaces

Orphanage

The Orphanage in Amsterdam (Figs. 36, 37) was designed by Van Eyck from 1955 on and completed in 1960. Although he already had designed three small school buildings for the newly developed village Nagele, in fact the design of the Orphanage was his first commission for a larger building. Van Eyck used this commission to implement his overall approach to architectural design in a comprehensive way. Although space formation plays an essential role in the design of the Orphanage, this building also very well illustrates Van Eyck's twofold reference to the concept of 'twin phenomena'.

Basically, the Orphanage is a single-story building. An exception is the elevated bar along the front elevation, which is oriented towards the city and with living rooms for the staff on the first floor. Next to this, a second floor with 100 m² in size, each housing bedrooms for children, is added at four other locations. Therefore, what distinguishes the building is its strong horizontal extension. It is a horizontal extension that is characterised by its rather slender shape and the resultant spaciousness and openness in the horizontal direction and the, in relation to this, modest height. Furthermore, the overall configuration is characterised by the arrangement of 2 x 4 group areas along two diagonal lines that are positioned to each other in a perpendicular way. Together with different office and service rooms, these group areas are arranged around or rather along a central courtyard (20 x 24 m), where the main entrance is situated. Although the Orphanage has, as Van Eyck expressed it, a 'bizarre' shape, which results from the permanent change of indoor areas and outdoor spaces along the group areas and all other rooms, it has one continuous façade. With this, the overall spatial configuration of the building is also characterised by a particular space-forming structure, within which the enclosed courtyard, which on the ground level is open only to the north, represents the heart of the orthogonal grid. From here, the building extends into three directions and the building's inside opens to the surrounding green.



38 Orphanage, sketch playroom group section

39 Orphanage, view into courtyard group section

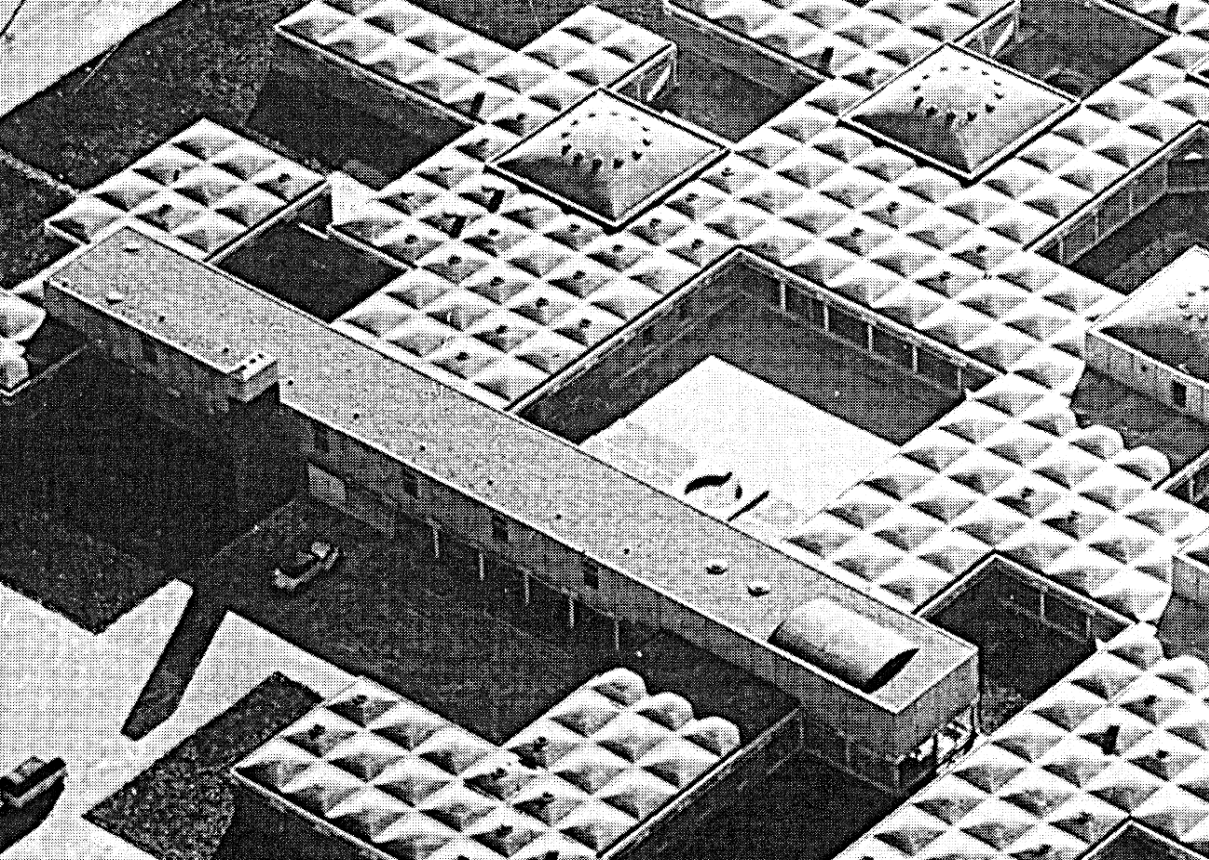


The shaping of (a configuration of) 'in-between' spaces

Next to this basic structure, the specific kind of space formation that characterises the whole building is the permanent simultaneity of enclosing and opening. The most demonstrative examples at the inside of the building are the three big playrooms for children aged two to 10 years. In a sketch of the room for children aged four to six years, Van Eyck explains how he attempted to complement enclosed spatiality and outside orientation (Fig. 38) at this particular room.

On the one hand, a distinct enclosed spatiality is shaped by means of a square room that is covered by a point-symmetric vault construction; it raises this room above the adjacent inside spaces. The resultant dominance is strengthened by lowering the floor in the middle section of the room. Furthermore, the two sides of the room are almost completely enclosed by a wall. One small opening, which gives access to this room, is positioned in the middle axis of the room. On the two other sides, this wall continues another third so that the square room is eventually enclosed along two-third of its borderline. On the other hand, the centred and the space dominating inside-orientation is broken into two ways: First, the point-symmetrical spatial enclosure is internally counteracted by shifting the lowered middle section and associated space-structuring elements to one side of the room. By so doing, a second eccentric centre within the room has been created. Second, the inside orientation is counteracted by opening the domed room along the two sides that have partially remained open to the adjacent rooms and to a courtyard. Interestingly, the subspace is configured and shifted in such a way that the diagonal direction of this opening does not only coincide with the room itself, but also with the spatial order of the sub-space. Thus, the opening of the spatial enclosure remains fully integrated in its spatial structure. In this vein, enclosing and opening, thus enclosed spatiality and outside orientation complement each other to shape in a reciprocal and compensative way the 'interiorization' of this space as a place of play and in relation to the surrounding inside and outside spaces.

Within the overall spatial structure of the building, however, each of the big play rooms forms, together with the adjacent rooms, an independent unit. The various units are, in turn, successively arranged along the two perpendicularly arranged diagonals, thus forming, together with the centrally positioned atrium, the fundamental structure of the whole building. Each big play room, continuing in the enclosing of the adjacent washing area and the so-called sleep boxes, additionally receives its spatial independence due to the courtyards that are positioned in between the successively shifted units and providing an open connection with the garden.



40 Orphanage, aerial view onto central courtyard

41 Orphanage, view into central courtyard



As a result of this alternating and stepping structure of inside and outside spaces, the vertical outside surfaces along the two diagonal rows of group areas (first and foremost, along the group areas for children aged two to 10 years) multiply to such an extent that the façade forms a continuous meandering line. Here, the building transforms into two, in recurring fragments subdivided inside-out zones, the one 10 the other 20 m wide. In this vein, the one continuous façade encloses inside as well as outside spaces and the inside-out dualism changes into a ‘peaceful’ coexistence within one in-between zone (Figs. 37, 39). This impression is strengthened by the clear and distinct application of either completely closed, translucent, or complete transparent surfaces and their connection in the one meandering façade. It is also strengthened by the distinct horizontal orientation that predominates the whole building. As part of this orientation, the continuous roof-edge with the underlying ribbon of architraves gives the meandering facade its continuity.

Another example of Van Eyck’s fundamental demand to design enclosed spatiality, which is simultaneously outside-oriented (and that integrates the socio-spatial function to create privacy, on the one hand, and an open relationship to the public, on the other) is the atrium in front of the main entrance of the building (Fig. 40). Different to the previous example, it is a complete outside space. Yet, it also poses an ‘in-between’ space—now in the shape of a real doorstep. It lies in front of the main entrance and therefore mediates between the rather private or collective realm at the inside and the public realm outside the building. Though it lies in front of the entrance, this atrium forms the spatial centre of the whole building. Therefore, the particular aspect of the atrium—it characterises its specific ‘in-between’ nature—is that it forms both the building’s spatial centre and the opening to the city.

The transition from the outside to the inside of this spatial balance point—this distinguishes the design of the Orphanage building from a traditional courtyard circulation—is shaped by the configuration of the atrium itself: On the north side, the atrium is open on the ground-floor level, but still gets enclosed by the above-running bar on the first-floor level (Fig. 41). It is additionally separated from the opposite side by the underneath situated ramp that leads to the bike racks in the basement. But since the west facade of the courtyard passes through under the elevated bar, the opening to the opposite side is also *actively* shaped. Here the enclosing and opening form a space-forming contrast, and the elevated bar clears the way, so to speak, for the west façade to run through. Yet, the west façade continues for 10 more meters and then deviates in the eastern direction in parallel to the bar. In this vein, it defines the beginning of a fourth courtyard façade, which, however, lies outside the courtyard space predominantly defined by the bar. With this, on its north-side, oriented to the public realm, the courtyard gets enclosed in a twofold way. It ‘breathes in and



42 Orphanage, interior street

43 Orphanage, view from the south-east



out,' as Van Eyck would argue. It takes the outside in the inside and relates itself to the outside. In this vein, the atrium represents an extended doorstep between the real covered inside of the building and its surroundings. The specific socio-spatial dynamic comes from the fact that the middle point of this *main* 'doorstep'—as the previously mentioned inside-out zones of the group areas also pose a series of doorsteps—really represents the middle, or rather balance point of the whole building.

Polycentric organisation

Around this middle point, a polycentric arrangement of the other sub-centres has been realised. On the right and left side of the atrium (if standing in front of the main entrance), there are two additional courtyards around which the administrative and the serving areas (including the care-taker's dwelling) are arranged. The remaining sub-centres are the inside-lying big play rooms of the eight group areas with attached rooms for secondary purposes like sleeping and washing, and an attached outside space. In three groups, this defined outside space is a real, albeit not entirely enclosed, courtyard. Only two rooms are not directly connected to an enclosed outside space: the room for festivities and the theatre and aerobic rooms. The first is oriented towards the open garden and the latter towards the street in front of the atrium. In this vein, all sub-centres require their meaning of (relative) centrality by shaping, in one or the other way, an 'in-between' realm between inside and outside, thus representing both, at the same time, the spatial centre and doorstep to the surrounding space.

The eight group areas are step-like arranged along two diagonals; they are situated perpendicularly to each other and enclose the atrium. Thus, the space-forming structure of the Orphanage is characterised by a series of 'in-between' spaces that all represent spatial sub-centres. All sub-centres and associated rooms are connected by the so-called 'inside streets' that receive their street character due to the applied materialisation of both walls and floor. Owing to the step-like arrangement of the group areas, these streets are also step-like in shape and prevent any continuous view through the building (Fig. 42). By contrast, the fully glazed façades, on the sides that are oriented towards the outside, establish a general outside orientation of the street space to the various courtyard spaces. Therefore, the two inside streets are also formed by a series of 'in-between' spaces lying between the polycentric network of the actual 'in-between' spaces. Thus, upon entering the Orphanage, one comes from one relatively independent place to the other, all explicitly designed as an inside-out relation. First and foremost, they are hold together and form one complete inside by

the one continuous roof that covers the whole building and ‘encloses’ all the various courtyards and the group areas that partially jut out above the roof.

Interlocking, disintegration, and cohesion

As illustrated above, one space-forming significance of the atrium lies in its quality to bring the public realm into the spatial centre of the Orphanage. This integration of the outside into the heart of the building is opposed by a disintegration of the actual covered inside. This disintegration results from the following arrangement of inside and outside spaces. As a space-forming structure, the Orphanage building has three inside-out zones and inside-streets lying in between. Leaving the inside-streets as intermediate spaces apart, we have with the atrium, on the one hand, and two diagonal group zones, on the other, a twofold way of shaping a real relationship between this covered inside and the uncovered surrounding outside. First and foremost, this relationship is characterised by a spatial interlocking of inside and surroundings, comprising the step-like arrangement of the group areas with alternating inside and outside spaces and the meandering façade accompanying this alternation. Taking the initial situation in the late 50s into account—a completely unbuilt area at the edge of the city and oriented towards the urban forest—this interlocking was one with the entire surroundings.²⁶³

However, next to the fact that this disintegration is balanced by the atrium that forms, as it were, the star within a small solar system, keeping the surrounding planets (group areas) together by its central position, this disintegration is balanced in two additional ways. First, it is balanced by the overall spatial configuration of the group areas. This is because the step-like alternation of inside and outside spaces along the two diagonals simultaneously implies - next to its effect of disintegration - also a unifying characteristic: The sameness of the ‘independent’ group areas and their repetition to one continuous row. Second, the moment of disintegration is counteracted

²⁶³ The moment of interlocking inside and outside remains a central characteristic of Van Eyck’s buildings. Particularly, the lower part of the extension for the ESTEC complex, build from 1987 to 1989, illustrates this, though the Tripolis building complex, which was built in the early 1990s directly behind the Orphanage (both designed in partnership with Van Eyck’s wife, Hannie), also shows the idea of interlocking the building with the immediate surroundings. In the Orphanage building, however, and strongly influenced by the extreme proportion between height and horizontal extension, this interlocking results in the spatial disintegration of the (covered) inside.

in a form-related or rather form-constructive (tectonic) way, namely by a continuous order of a few structural elements: First, the 327 point-symmetrical vaults, 3.36 by 3.36 meter in size, counteract the building's spatial disintegration by forming together one continuous roof structure. Here they offer a basic order which is so small that it permeates each single room including the lower parts of the group areas. It additionally expresses unity due to the non-distinguishable number of vaults. Second, the expression of unity is further enhanced by the underlying continuous ribbon of architraves: They define within the same construction logic of 3.36 meter the outline of the roof shaped by the apparently endless number of vaults (Fig 43).

Thus, in case of the Orphanage building, we see how Van Eyck's twofold design-oriented reference to the notion of 'twin phenomena': in terms of creating (a configuration of) 'in-between' spaces, on the one hand, and in terms of applying the 'twin-phenomenological' design principles 'part-whole' and 'diversity-unity', on the other hand, complement each other rather than an implementation of the latter would superimpose the present kind of space formation and the creation of (a configuration of) 'in-between' spaces. For such a superimposition, the space-forming structure with its various inside-out zones is too multi-layered and dynamic. In the subsequent designs and built projects, from the church in Driebergen, which was designed in 1964, to the Court of Audit in The Hague, which was completed in 1997, in two projects such a superimposition is clearly discern, while in earlier projects this is not the case at all.²⁶⁴ In this sense, after the design of the Orphanage building, Van Eyck's architectural work shows two different lines of development. As I will argue, these lines are eventually combined in the design of the Chamber of Audit.

Pastor Van Ars Church and Sonsbeek Pavilion

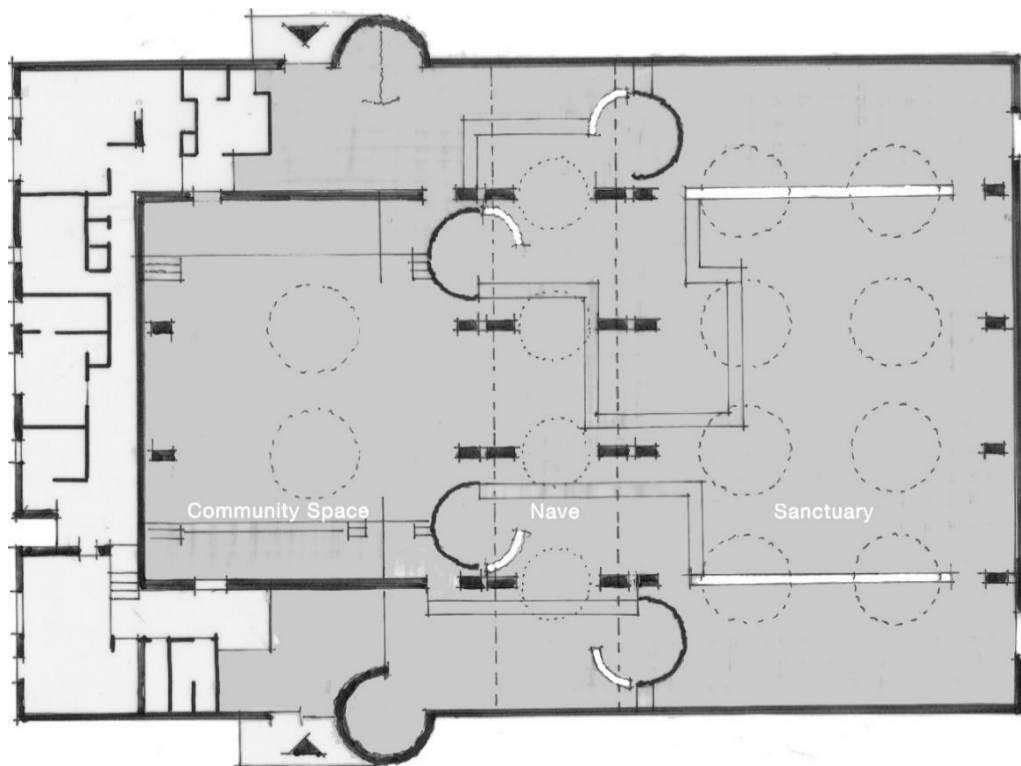
Particularly in the 1960s, in continuation of the realisation of the Orphanage, Van Eyck designed and realised projects by which the implementation of 'in-between' space(s) took centre stage. In this regard, the two most illustrative examples are the Pastoor Van Arskerk in The Hague, designed from 1963 on and built in 1969, and

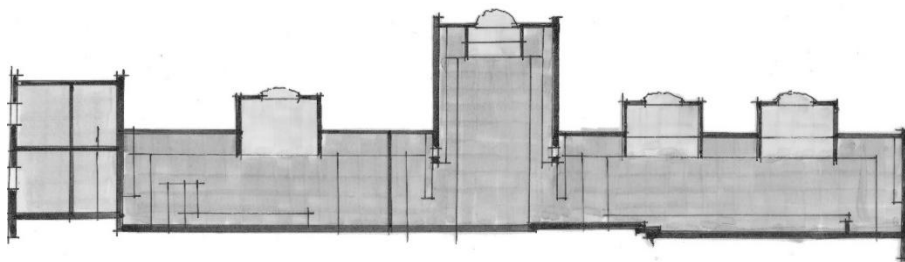
²⁶⁴ The reason for this difference certainly is the difference in size. Additionally, it is determined by the fact that in the early 1960s Van Eyck abandoned his examination of the concept of the 'configurative discipline' to focus on space formation and the shaping of the defined 'in-between' spaces. Regarding this change, which was initiated by a fundamental disagreement between Van Eyck and other Team 10 members concerning Van Eyck's 'configurative' approach, especially with Alison and Peter Smithon, see: Francis Strauven. *Team 10 Royaume 1962*, in Strauven, 1998, 397–406.



44 Pastoor Van Ars Church, view from nave into sanctuary

45 Pastoor Van Ars Church, groundfloor





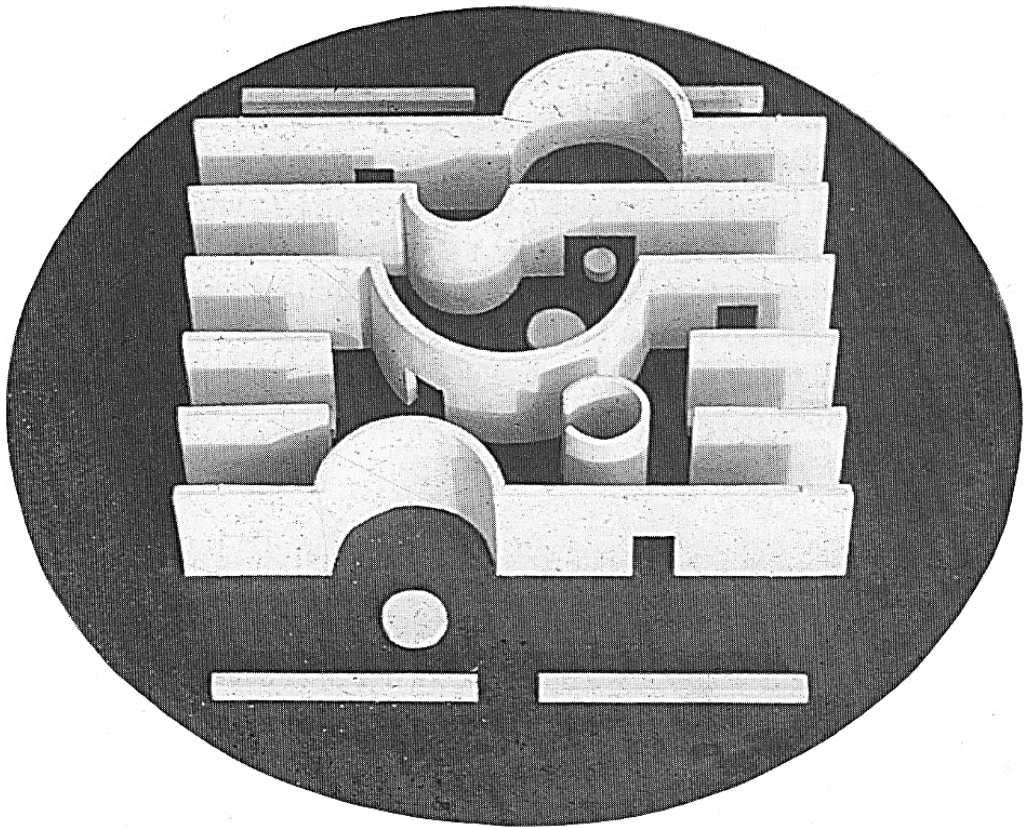
46 Pastoor Van Ars Church, section

the Sonsbeek Pavilion in Arnhem, built in 1966.²⁶⁵ In the design of both these buildings, space formation itself took centre stage, though it did so in two opposed ways. In the Pastoor Van Arskerk, a completely inside-oriented ‘in-between’ realm is shaped. In contrast, the Sonsbeek Pavilion is designed as a completely open structure and represents the implementation of a space-forming concept rather than a building. Nevertheless, it is chosen as an example, since the combination of the Orphanage, the Van Ars church, and this pavilion illustrates the whole range of how Van Eyck’s use of space formation is dominated by the shaping of ‘in-between’ spaces.

The Pastoor Van Arskerk

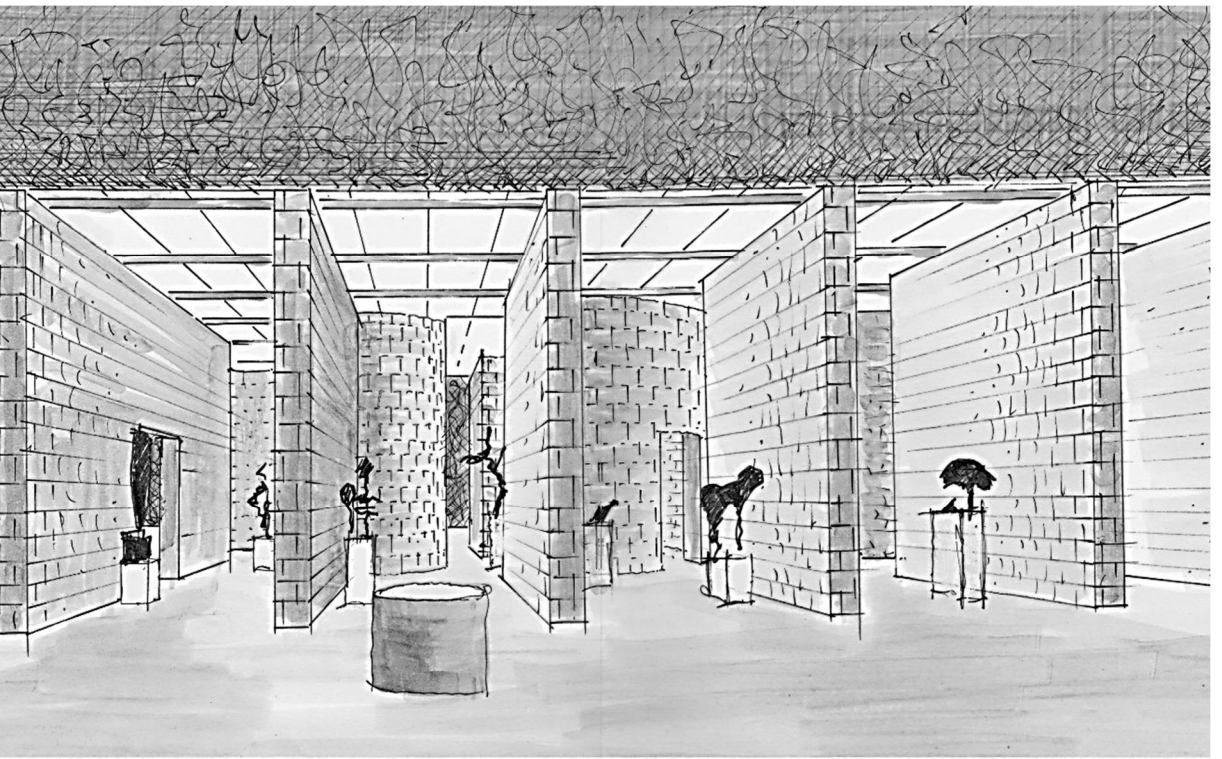
The overall spatial configuration of this Catholic church is characterised by the differentiation of one continuous inside space of 25 x 35 meter in three zones (Figs. 44–46). This differentiation is realised by a nave that is four meters wide and 10 meters tall; it runs over the whole width of the building and subdivides the remaining four-meter tall space into two separate parts: one that is used as the sanctuary and forms, together with the nave, the actual church space, and another which accommodates an additional community space. Since this community space is additionally defined by a U-shape (15 x 13 meters) and can be completely separated from the nave by a curtain, it represents an independent space. Since the community space can be surrounded and the curtain can be pushed aside, it remains an integral part of the whole. The resulting integration of the secular part of the parish in the church space is the

²⁶⁵ Intended as a temporary construction, it was demolished in the same year, but rebuilt in 2006 in the park of the Kröller-Müller Museum in Otterlo.



47 Sonsbeek Pavilion, model

48 Sonsbeek Pavilion, view from the left side



very core of Van Eyck's programmatic approach of this church design. This integration is realised not only at the level of the spatial arrangement of the three zones, but also at the concrete physical level of material enclosing and opening. On both sides—the sanctuary and the community space—the nave defining wall is almost completely open up to a height of three meters. Furthermore, the remaining four pillars on either side are shaped as slabs (0, 3 x 2,0 meters) and are oriented in the longitudinal direction by which the moment of opening and connection is underpinned. It is the positioning of two semi-circular walls next to the altar that creates, together with the altar, a clear distinction between the community room and the actual church space.

In terms of the creation of an 'in-between' space, the essential feature of its implementation is the complete inside-orientation of the church and the combined use of the vertical and horizontal dimension to separate the three zones from, and to relate them to, one another. First, the only outside orientation, which is present, is directed to the sky. As a result, the only possible mediation between two spatial realms is the mediation between two different inside spaces. This mediation takes place between the sanctuary and the community space by the nave. Thus, the created 'in-between' space simultaneously poses the very centre of the church and thereby dominates the whole interior. However, the special feature of the nave—mediating between the two other completely enclosed spaces—is that this mediation is realised in a pure spatial way and by means of a difference in height and over the whole width of the church. Also, without the separating elements between the nave and the community room, this pure spatial way of mediating, namely separating *and* connecting, would function. What makes now this kind of 'in-between' space so special for Van Eyck is the acknowledgement of the representational, object-like character of space, of enclosed spatiality—whether he did that consciously or not.

The Sonsbeek Pavilion

In comparison with the Pastoor Van Ars church, the Sonsbeek Pavilion is characterised by the creation of an opposite kind of an 'in-between' space (Figs. 47, 48). As the 'in-between' space of the church mediates between two completely enclosed spaces and thus within a complete enclosed spatiality, the 'in-between' space of the pavilion is characterised by the whole building and by mediating between the two sides of one and the same outside space: the open space of the park, thus within a complete outside orientation.

The relative enclosed spatiality of the pavilion is defined by a flat glass roof, 15 x 15 meters in size, which defines that ‘in-between’ space in its vertical extension. Furthermore, it is defined by eight parallel walls, about 20 meters long and five meters tall, and positioned on six parallel axis with a distance of about three meters. These walls, above which the roof seems to float, exceed the roof in their longitudinal orientation. This underpins the horizontal motion and outside orientation already resulting from the parallel positioning of the walls. The overall spatial configuration of this outside-lying ‘in-between’ space is now further characterised by its deviation in five passages and which get combined and transformed into semi-circular spaces - both concave and convex in shape - in the middle zone that covers with 10 meters the half of the whole pavilion. This configuration is completed by a series of openings by which the different passages are connected in cross-directions and by which the separated passages are combined to an interconnected entity. Owing to the differentiation between the middle zone of 10 meters and two edge zones of five meters each, this interconnected entity is additionally subdivided into three zones: the middle zone with semi-circular shapes and where the actual encounter takes place, and two zones that mediate between that middle zone and the outside space of the park by functioning as a passage between them.

Next to this focus on the creation of two specific kind of ‘in-between’ space, particularly in the architecture of the pavilion the implementation of the ‘twin-phenomenological’ design principle ‘unity-diversity’ is present. It is present in the combination of one roof, under which and along six parallel axis the same type of wall is differentiated in various shapes that create a clear and at the same time multifaceted configuration of different subspaces, each defined to shape a place for a particular sculpture. Even though also the principle of ‘part-whole’ is therefore also present—and in its most basic variation necessarily present in any ‘in-between’ space, thus also in the Pastoor Van Ars Church, in both projects this principle is rather present in an indirect way and without dominating the building’s spatial configuration. This, however, is the case in the project, with which I wish to continue.

6.2.2 ESTEC extension, Tripolis Complex, and Court of Audit: Designing the Twin Phenomena ‘Part–Whole’

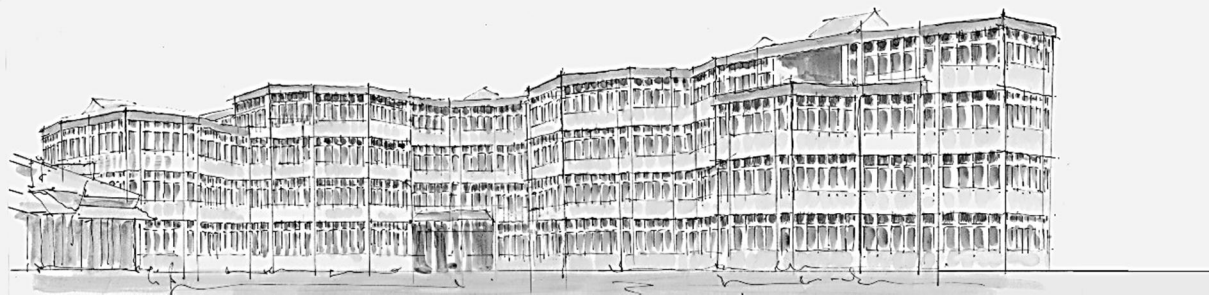
To the clear superimposition of the present space formation belongs the design for the extension of the ESTEC complex in Noordwijk, which was as a whole designed

from 1984 on and completed in 1989 (Figs. 49, 50). In the higher part of this extension, the part that contains additional office spaces, the 'twin-phenomenological' design principle 'part-whole' strongly determines the space-forming structure of the building, both at the level of its overall spatial configuration as well as of the materially design inside-out relation.

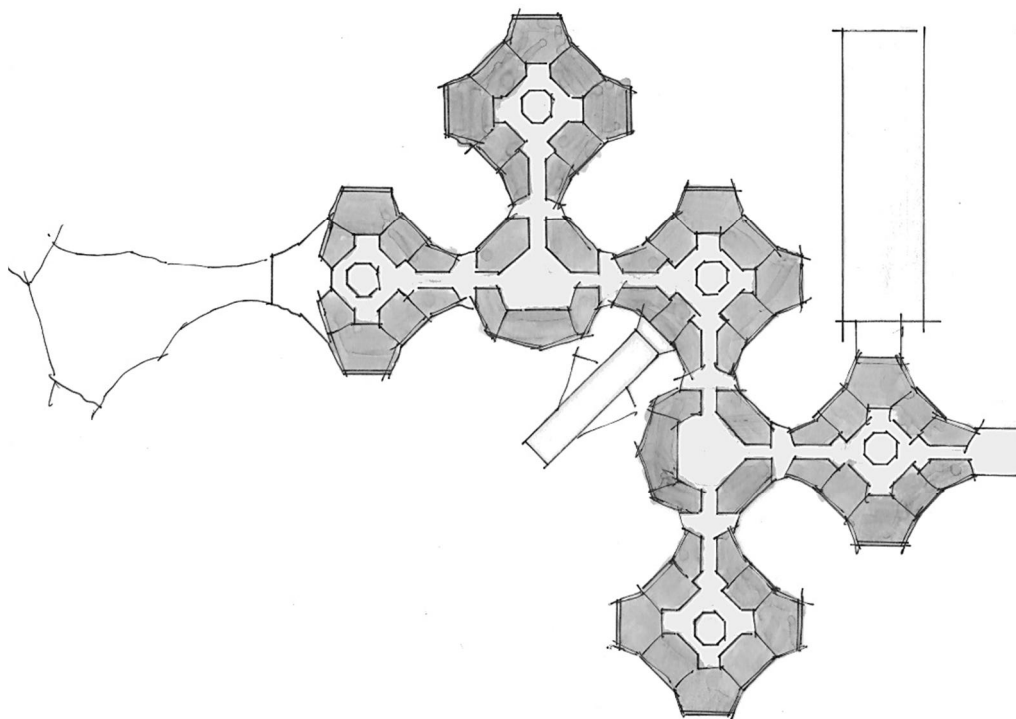
Similar to the overall configuration of the Orphanage, this higher part of the extension is characterised by a filigree structure with a strongly meandering façade and a high outside orientation of the building's inside. Here this inside is either oriented towards a large entrance space defined by the building itself at the front side, to four smaller courtyard spaces at the back side, or towards the further surroundings. Except for this similar open character, the building strongly differs from the Orphanage. Among others, it differs in the implemented kind and structure of corridors, which is certainly influenced by the different use and the building's multi-story nature. Next to their strict orthogonal ordering, the corridors are axially positioned between a mirrored arrangement of office rooms. Furthermore, and coming to the artistic implementation of the twin phenomena 'part-whole,' this higher part of the extension is subdivided into seven distinct sub-parts that are arranged in a way that five identical parts get interconnected to a continuous horizontal-orthogonal structure by two slightly different parts, lying in between and connecting three parts respectively.

Basically, owing to a rather organic shape, the separated parts get both clearly defined and bound together at the same time. This is realised by a façade within which convex and concave sections continuously alternate, whereby the convex sections define the singular parts and the concave sections their conjunction to a whole. At the side of the entrance, the side where the building shapes the main outside space between itself and the lower part of the extension, this alternating façade forms a whole by enclosing that main space and shaping one big square.

In a different way, we see this double function of that meandering shape: to create spatial independence and coherence inside the building. Here the continuous system of corridors is characterised by leading from one central space to the following, all defining the centre of each of the seven sub-parts. By walking through this part of the extension (no matter on which floor) one clearly recognises the differentiation in several identical parts. Being inside the office rooms, however, the impression changes into the recognition of the interconnection of this sub-part with the rest of the building. This is because all the office rooms are, in one or the other way, oriented to a partially enclosed outside space. As a result, the façade through which one looks from the inside always encloses the space on the opposed outside to which the view is oriented. In this sense, the formation of defined spaces is indeed integrated both at the outside and the inside in a rather formal overall configuration of identical



49 ESTEC extension, view onto front facade



50 ESTEC extension, floorplan 1st / 2nd floor

51 Tripolis complex, aerial view



building sections. Most interestingly, if all the seven sub-parts would contain the same number of floors, the building would indeed represent a formal as well as a space-forming entity.

Since it forms an mediating element between the original higher building and the much lower extension, this unity mainly is realised by another layer of the artistic implementation of the twin phenomena 'part-whole': at the level of the façade architecture. Next to its subdivision into convex and concave sections, the façade is characterised by the inclusion of an apparently indefinite repetition of small vertical windows. This repetitive structure fulfils a similar function as the 327 vaults in the Orphanage building: It unites the various space-forming parts based on an order that interpenetrates, in turn, each of these parts. A third structuring element of the façade which mediates between this smallest and most individualising element of the facade and the alternating figuration of convex and concave façade sections, are the vertical knuckle-lines. They indicate the actual tectonic element of the façade: the bearing columns behind.

As a result, the artistic implementation of the twin phenomena 'part-whole' clearly determines the space-forming structure of the building, thus the present configuration of 'in-between' spaces, both at the level of its overall configuration and of the designed inside out-relation. The resultant formal way of space formation indeed determines the building's architecture, and what is clearly to be experienced from the inside and the outside.

The Tripolis complex in Amsterdam (Fig. 51), completed in 1994, shows a different kind of superimposition of the present kind of space formation by the demand to shape a coherent whole out of uniform parts. The design differs from that of the ESTEC extension in the way how the parts (now 10 + 3 instead of 5 + 2) are arranged, namely in the form of three independent and partially opposing buildings and in a less continuous way of alternation between convex and concave façade sections. As a result, the alternating almost wave-like motion is much less present, from which results, in turn, that the intended 'twin-phenomenological' reconciliation of part and whole gets stuck half way, as it were: at the point of the integration of the individual parts into a unifying whole. This is the case at the level of the overall configuration of the building's complex as well as with regard to the designed inside-out relation by means of a specific facade. Here, this integration is realised in a rather formal way, that is, by a continuous materialisation and the formal design of the continuously repeated windows. They now differ in colour to emphasise the aspect of individuality, whereby the size increases per storey in order to counteract the perspective reduction and to emphasise, in this vein, the aspect of sameness. Though this formal way of integrating individual parts in a unifying whole is merely indirectly



52 Court of Audit, aerial view

53 Court of Audit, 2nd floor

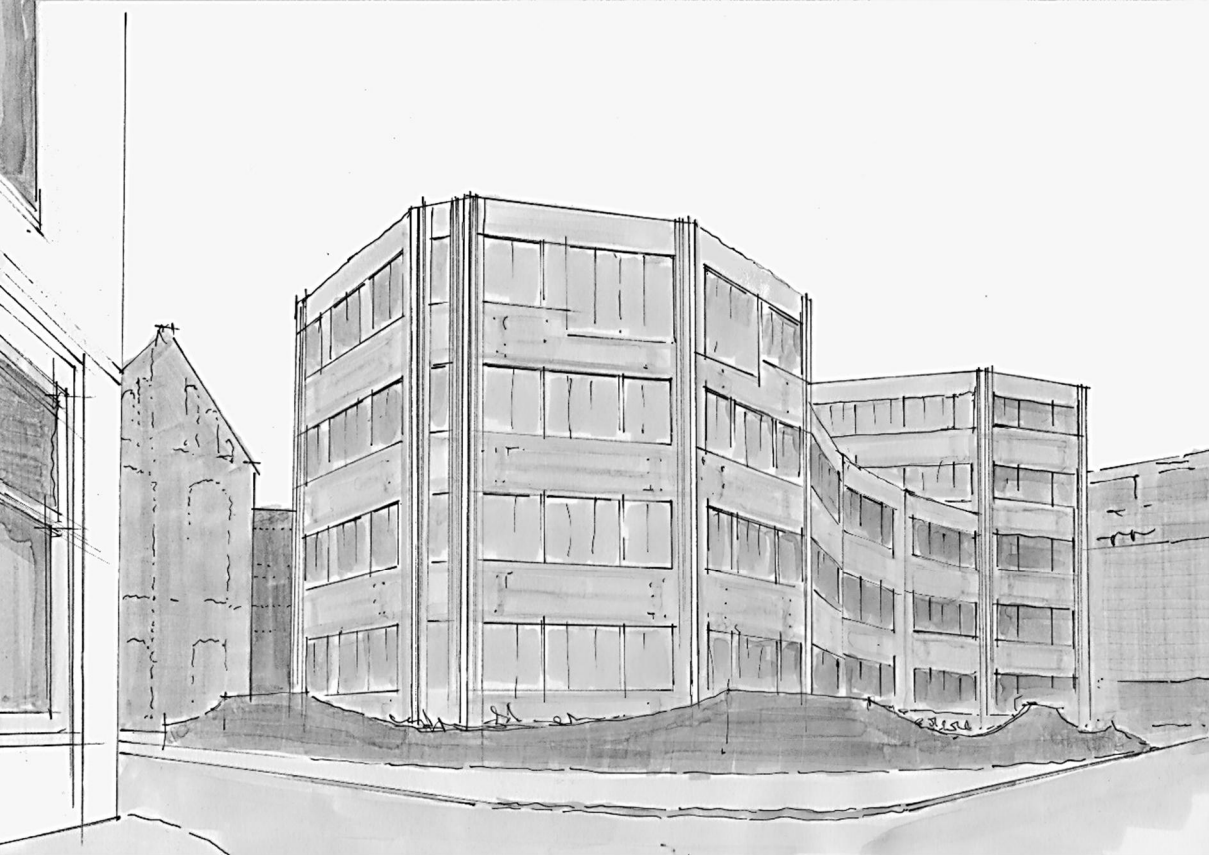


related to the present kind of space-formation, it dominates the building's appearance. As a result, the present kind of space formation, of shaping configuration of) 'in-between' spaces rather disappears behind the expressive design of both built form and facade.

The Court of Audit: Integrating the twin phenomena 'part-whole' in the shaping of 'in-between' spaces

The design of (the extension of) the Court of Audit in the historical centre of The Hague (Figs. 52, 53), designed from 1992 on and completed in 1997, now shows an integration of the 'twin-phenomenological' design principle of 'part-whole' in the present space formation rather than its superimposition. First, this difference to the ESTEC and Tripolis project results from the size and compactness of the design, as well as by the absence of the clustering of same or identical parts of buildings. Second, it results from the correspondingly pure form- and construction-related reference to the twin phenomena 'part-whole'. Third, it results from the dominant role that the shaping of 'in-between' spaces takes in the design and which is strong enough to indeed integrate the form- and construction-related application of a 'twin-phenomenological' design approach.

The overall spatial configuration of the building is characterised by the positioning of an organic and rather compact triangular shape (three- to five-stories high) within an enclosed urban space. On two sides this space is surrounded by a small street with a residential building structure on the opposed side. On the two other sides it is surrounded by an office building, the choir of a church, and the existing part of the Chamber of Audit. Next to the streets, the only open space that remains between the existing buildings and the extension is 10–15 meters wide. Furthermore, this configuration is characterised by the creation of two separate 'in-between' spaces from which one connects the surroundings (the street-spaces within which the building is situated) with its core: the central courtyard with a terrace on the second floor. The other 'in-between' space is created at the opposite side—between the back of the church and the adjacent office building, on the one hand, and the new main entrance of the Court of Audit, on the other hand. Although the ESTEC extension and the Tripolis complex are also arranged around a defined central outside space—a space that represents an in-between realm between the building's inside and its surroundings—the terrace-space of the Court of Audit forms an integrated part of the building. Owing to the just as enclosed character of the urban space, this in-between represents a *nested* configuration of two kinds of enclosed spatiality: terrace and urban

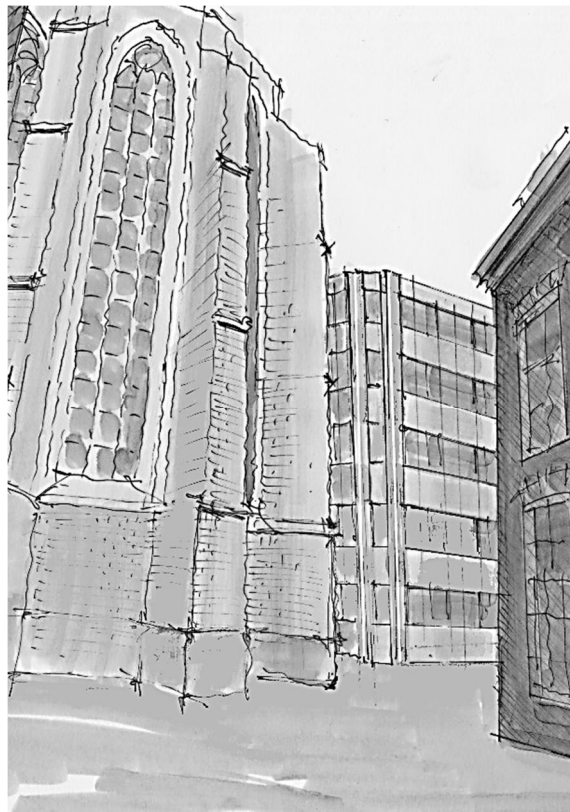


54 Court of Audit, street view

55 Court of Audit, view along backside



56 view toward entrance zone



space. The subdivision of the latter into two opposed spaces additionally results in the fact that the inside of the building is situated between two 'in-betweens' spaces which are both opposed to and connected to each other.

In this vein, the design of the Court of Audit represents, in space-forming terms, an intertwinement between the building's covered inside and the two 'in-between' spaces. Here particularly, the wave-like shape of the building 'actively' shapes this intertwinement. It does so due to its polygon, non-uniform triangular shape with its alternating enclosing of inside and outside. By reducing on the second floor into a Y-shape and on the fourth floor into an L-shape, the building's wave-like shape also 'shapes' the spatial relation between the terrace and surroundings. Despite the organic-sculptural appearance of the building, strengthened by the colouring of the façade, the act of intertwinement of the two outside- 'in-between' spaces and the building itself clearly dominates the design. It does so because the wave-like motion of the building's external shape continues at the inside into the internal corridor system, which, at least from the second floor onward, provides an outside orientation towards two of the three outside realms. The most present, however, is the intertwinement at the outside, where the wave-like character clearly dominates the façade and turns the façade into a space-forming element.

As such, it does not only connect inside and outside by means of the present doors and windows, but also owing to its spatial figuration. Both are combined in the following way. Basically, the façade consists of alternating windows and balustrade strips of equal height (Fig. 54). Accordingly, enclosing and opening are oriented in the same horizontal direction and enclose *together* the inside lying behind. This considerable integration of the opening element into the enclosing shape gets completed by the grey-blue colouring of the balustrades—a colouring that adapts the balustrades to the windows and their mirroring of the grey-blue sky. It gets completed by the little depth of the window recess and the corresponding plane-like appearance of the balustrades. Therefore, the windows and balustrades shape a thin, screen-like separation. This separation divides, on the one hand, inside and outside in a clear and distinct way. On the other hand, it creates a clear view into the building's inside and vice versa. Owing to this kind of fusion of enclosing and opening, the façade *does* not open, but rather *is* open. This means that it poses an open enclosure. This open screen-like character strengthens the wave-like motion of the façade and the shaping of the above-stated intertwinement of the two outside- 'in-between' spaces and the building itself.

This screen-like character gets counteracted, however, by the vertical cannelures (detailed as open rain pipes) that are situated at the knuckle lines between the polygon surfaces. Positioned directly in front of the real columns of reinforced concrete, they

are the only vertical elements within the façade's architecture. With this, the opposition between the unity of enclosing and bearing, on the one side, and opening, on the other side, which characterises the brick facades of the surrounding buildings, get contrasted with an opposition between the unity of enclosing and opening, on the one side, and bearing on the other. This, particularly, is face to face with the Gothic choir, where this construction-aesthetic and thus tectonic contrast comes to its own (Figs. 55, 56): The outside wall of the choir is a configuration of vertical wall pillars and vertical openings. Here the reduction on the vertical wall pillars is the precondition for such opening. Bearing and opening complement each other. This principle of a tectonic, since skeletal masonry construction, the façade of the Court of Audit opposes a different kind of synthesis between bearing, enclosing and opening: a fusion of enclosing and opening and a

contrary tectonic construction. In this vein, the designed 'communication' between both facades is realised by different combinations of bearing, enclosing, and opening.

In shaping the outside lying 'in-between' spaces and the interconnection between them and the building's inside, this *horizontally* acting screen-like and open enclosure creates and represents the *uniting* element of the design, while the *vertically* acting tectonic structure of cannellured knuckle lines represents the element of *individualisation* that amounts to separating the whole in parts. In comparison with the ESTEC extension and the Tripolis complex, the vertical knuckle lines in the Court of Audit get rendered as a relatively independent element. In this vein, the columns remain an integral part of the space-forming structure: the continuously moving wall. In the Orphanage building, the bearing columns are instead completely independent from the non-bearing enclosing walls and separations, and are of a space-forming relevance only so far as they support the covering roof construction.

As a result, in the design of the Court of Audit extension, the artistic implementation of the twin phenomena 'part-whole' remains completely integrated into the present kind of space formation. It does not superimpose the shaping of 'in-between' spaces, since it is limited to the design of the built form itself and does not aim at the overall configuration of spaces. In this sense, Van Eyck's twofold artistic reference to the notion of 'twin phenomena' again - though in a completely different way than in the Orphanage - complement each other rather than an implementation of the latter would determine the present kind of space formation.

6.3 Conclusion

As far as it is based on his concepts of 'interiorization' and 'in-between', I already concluded that the forming of defined spaces and spatial relations played a central role for Van Eyck. He regarded the enclosing and opening of space, the shaping of enclosed spatiality and outside orientation, as the two essential instruments in the creation of 'in-between' places, thereby enabling a specific experience and thus interiorization of space. With this, Van Eyck's (implicit) reference to space formation differs from that of Gropius in not neglecting the socio-spatial meaning of space formation. Instead, it takes centre stage. Furthermore, I concluded that his 'twin-phenomenological' design approach, however, imply a potential superimposition of the shaping of 'in-between' places, in particular, by the application of the twin phenomena 'part-whole' to the spatial configuration of spaces.

The analysis of the various buildings confirms this conclusion. First, it has been shown that the development of Van Eyck's architecture oscillated between the creation of 'in-between' spaces, thus places, and the implementation of a 'twin-phenomenological' design approach, in particular by the design principle 'part-whole'. Already in the Orphanage building, the presence of both could be demonstrated along their complementing implementation. On the one hand, I described the Orphanage as a configuration of a series of 'in-between' spaces. It is a configuration which extensive use of inside-out zones leads to a certain disintegration of the building as a space-forming entity. On the other hand, this disintegration is counteracted both in a space-forming way by the central courtyard, and in a distinct formal way by the design of the roof construction. The analysis of the Pastoor Van Ars Church and the Sonsbeek Pavilion, which realisation followed the design and the construction of the Orphanage, has shown a clear focus on space formation. Next to exemplifying together Van Eyck's wide spectrum in the creation of 'in-between' spaces, we may conclude from the church design a certain acknowledgement of the representational, object-like character of space, of enclosed spatiality. The analysis of the ESTEC and the Tripolis projects, in turn, has demonstrated a clear superimposition of the creation of (the configuration of) 'in-between' spaces by the formal implementation of the twin phenomena 'part-whole'. With the Court of Audit, in turn, a clear integration of the latter in the present kind of space formation could be proved. Besides, the difference between superimposition and integration lies in the limitation of the 'twin-phenomenological' approach to the design of the built form and its construction.

Unfortunately and similar to Gropius, there is no statement from Van Eyck that would allow to get a better insight into his (implicit) reference to space formation.

There are also no statements on this double and potentially conflicting nature of his approach to architectural design, regarding the creation of a ‘twin-phenomenological’ reality at the level of architectural design. However, and what brings us to the subsequent concluding Chapter, this conflicting nature is also tied to Van Eyck’s concept of architectural aesthetics.

7 CONCLUSION: GROPIUS'S AND VAN EYCK'S WAYS OF RELATING THE AESTHETICS AND THE PURPOSIVENESS OF ARCHITECTURAL DESIGN

In the four previous chapters, Walter Gropius's and Aldo van Eyck's differing approaches to (the perception of) space and their (implicit) references to architectural space formation have been comparatively analysed. In addition, their references to space formation have been exemplified by various architectural designs. As a continuation of the intermediate conclusions I have drawn, this chapter discusses the third and fourth research questions. I will firstly examine whether Gropius and Van Eyck related space formation (the element to which they referred) to the perception of (architectural) space and how—on the basis of which particular concept of architectural aesthetics—they linked the purposiveness and aesthetics of architectural design in different ways. In relation to the second question, this chapter discusses Gropius's and Van Eyck's concepts of architectural aesthetics. Although their ideas about architectural aesthetics appeared in Chapters 4 and 6, they have been rather implicitly described. In Chapters 3 and 5, these ideas do not appear at all, thus indicating that a connection between the perception—or experience—realm of space and architectural aesthetics is present neither in Gropius's nor in Van Eyck's approach to (the perception of) space.

Following the overall order of this research, this chapter focuses firstly on Gropius and secondly on Van Eyck. At the beginning of each section, I firstly provide a short summary of my intermediate conclusions concerning the references to space formation and secondly discuss whether or not the approach to (the perception of) space (potentially) includes the perception of space formation and its use-related, and socio-spatial meaning. After this rather indirect examination of Gropius's and Van

Eyck's concepts of aesthetics alongside whether or not they include the sensuous perception of space, the concepts themselves are explained. Finally, this chapter is concluded with a final consideration that follows from the preceding findings.

7.1 Walter Gropius

The intermediate conclusions I have drawn with regard to Gropius's implicit reference to space formation have painted an inconsistent picture; on one hand, and as far as it was based on his overall approach to architectural design, this reference is characterised by a practical, use-oriented concept of design. The reference conceives space formation in both an implicit and limited way—firstly and foremostly as a practical tool in the use-oriented arrangement of spaces. Furthermore, it is a reference by which the socio-spatial meaning of space formation—to create protection and privacy by means of the spatial enclosure of spaces—disappears from view, which aligns with the general orientation within the Neues Bauen that focuses on space in terms of motion and openness. Rather, the notion of (socio-)spatial enclosure is 'replaced' by use-technical and production-technical separation, as is also true for the opening and immediate relating of spaces. Gropius seems to have exclusively (if at all) identified the use-related arrangement of spaces with a certain socio-spatial meaning. He seems to have neglected the immediate (socio-)spatial meaning of space formation—of separating and enclosing spaces, of opening and relating spaces, and thus of creating enclosed spatiality and outside orientation. However, in many educational and some residential buildings, all of which were designed after Gropius left Germany, an orientation towards the design of enclosed outside spaces and courtyards as well as towards the designing of (an interplay between) enclosed spatiality and outside orientation has been demonstrated and is accompanied by a different (implicit) reference to space formation.

The answer to whether and how Gropius related space formation to the perception of space can be found in his approach to (the perception of) space. I have concluded that the approach's specificity lies in Gropius's ambition to make space itself tangible. From this ambition follows his general concept of space as number and motion, which modifies the perception of space to an interplay of the perception of defined portions of and unlimited motion in space. At the same time, Gropius's approach is also characterised by neglecting the significance of the corporeal—the anatomical-physiological constitution of man in space—to the perception of (architectural) space. Correspondingly, it is also characterised by the neglect of the experience

of architectural space as a relative enclosure of the perceiving human being. As a result, Gropius's concept of space as number and motion misses a fundamental part of the human perception and examination of space. In Gropius's view, this perception is reduced to a purely psychological mode of perception. The sensuous perception of spatial enclosure and the resultant enclosed spatiality is replaced, as it were, by the recognition of space as physically defined volumes or partitions of space. The sensuous perception of relative openness and outside orientation is 'replaced' by the recognition of space as motion. As a result, an actual concept of the *sensuous* perception of architectural space is absent.

What is more, Gropius's approach to (the perception of) space and his reference to space formation—as it results from his overall approach to architectural design—complement each other in their abstractness. They do so, by neglecting the moment of (relative) enclosing: the former at the level of its architectural manifestation and the latter at the level of its sensuous perception. The neglect of enclosed spatiality finds its counterpart in the underlying neglect of the physical–spatial constitution of man and in the neglect of the experience of architectural space as the (relative) enclosure of one's own body. A second coincidence is the resultant image of space as defined volumes or partitions of physical space. Eventually, this abstractness illustrates Gropius's abstraction from the immediate social being as well as the concrete spatial existence of man in terms of space formation and the perception of space. As I concluded at the end of Chapter 4, the associated notion of architectural space as abstract volumes of space herein perfectly functions as a projection screen for the production–technical and organisational implementation of use and social life. The notion also corresponds with the abstract kind of design that Gropius identified with an architectural style of the Industrial Age.

Consistent with Gropius's rather abstract approach to the sensuous perception of space, I have not identified any explicit link between the perception of space and architectural aesthetics; rather, and as my building analysis has already indicated, Gropius refers to architectural aesthetics in a form-oriented and formal sense in terms of object aesthetics. At this level, however, he clearly links architectural aesthetics with the purposiveness of architectural design.

Gropius's concept of architectural aesthetics

As far as we can conclude from his writings—and in line with the traditional concept of architectural aesthetics inherited from the nineteenth century—Gropius's concept of architectural aesthetics is firstly and foremostly object-oriented and identifies it

with the artistic design of architectural form. This is notwithstanding the fact that perception is self-evidently present in an implicit way, as each architectural design and its associated, intended expression necessarily implies its perception. At the same time, this object-oriented concept of architectural aesthetics includes the design of space—that is, the aesthetic effect of architectural form on the associated space. Moreover, particularly in Gropius's aforementioned discussion of colour's psychological effect on the perception of architectural space, his concept of architectural aesthetics shows an explicit reference to the perception realm, albeit in mere psychological terms.

The term 'aesthetics', however, does not itself appear in Gropius's writings. Where he refers to the realm of aesthetics, he uses the adjective 'aesthetic', pointing to corresponding aspects or considerations of architectural design—particularly to the formal configuration and ordering of architectural forms, their proportional design, and their use of contrast and colour.

Just as Gropius's reference to space formation results from his overall approach to architectural design, the same is true for his notion of aesthetics in architecture. Here, the term 'aesthetic' appears in relation to both the described intention to develop an architecture of the Industrial Age²⁶⁶ as well as the also-described view of approaching the design of architectural form from the perspective of its use-related function.²⁶⁷ Hence, Gropius links the industrial and use-oriented designing of architectural form with architectural aesthetics. His idea of a contemporary design is one that corresponds with and artistically ascribes form to the expression of the Industrial Age's rationality because, according to Gropius:

*The new time requires an own sense. Corresponding to the energy and economy of our public life, the precisely shaped form, without any randomness, clear contrasts, the structuring of the constituent elements, the sequencing of similar parts and the unity of form and colour will become the aesthetic munition of the modern architect.*²⁶⁸

Furthermore, this design must also correspond with and bring to expression the use-related organisation and essence of a building. Gropius's integration of both meanings into one kind of contemporary design is most effectively expressed in his catalogue entry for the Bauhaus Exhibition of 1923, which I would therefore like to recall for the final time:

We want to create the clearly organic construction body, naked and radiating from inner laws without lies and trivialities, which affirms our world of machines, wires, and fast vehicles, which

²⁶⁶ See: Chapter 4, 4.1, Gropius's overall approach to architectural design.

²⁶⁷ Ibid.

²⁶⁸ Gropius [1913] 1987, 56.

*out of itself functionally clarifies its meaning and purpose via the tension of the built masses, and that discards anything unnecessary, that obscures the absolute form of a building.*²⁶⁹

Another specific element of Gropius's view on such functionalistic design was his demand for designing the use-related purpose of a building as its very essence. In this respect, architectural design becomes charged with the potential to artistically bring this essence to expression in built form.

As a result, and due to Gropius's object-oriented concept of architectural aesthetics, an integration of the use-related purposiveness of architectural design into its aesthetics accordingly takes place at the level of the built form design, although this manifestation includes its visual perception from both the outside and inside. In line with Gropius's general reference, space formation has a corresponding function in this aesthetic concept of design; as such, similarly to the built form as a whole, it simultaneously represents a medium of the intended artistic manifestation of a use-oriented and industrial architecture. In this respect, one may argue that the explained neglect of the socio-spatial meaning of space formation is mirrored at the level of the built form design, which means the manifestation and corresponding artistic expression of space formation's concretely socio-spatial purpose is neglected and replaced by the integration of space formation into the symbolic expression of the use-related content of a building with which the socio-economic context of the Industrial Age is consciously linked.

7.2 Aldo van Eyck

Although Van Eyck, similarly to Gropius, nowhere mentions the term 'space formation', the intermediate conclusions have clearly indicated the significant role space formation played in his overall approach to architectural design, which is particularly evident in relation to the architectural implementation of the 'in-between' concept. What also becomes evident here is that Van Eyck fundamentally differs from Gropius in that he does not neglect the immediate socio-spatial meaning of space formation; to Van Eyck, this meaning takes centre stage. At the same time, I have concluded that his 'twin-phenomenological' design approach and the associated twofold concept of 'twin phenomena'—both of which result from the significance he ascribes to the relativity concept—potentially imply an artistic superimposition of the creation of 'in-between' spaces and the artistic effect of this creation, particularly

²⁶⁹ Gropius [1923] 1987, 90.

through the application of the twin phenomena of ‘part–whole’ and ‘diversity–unity’. My analysis of Van Eyck’s buildings confirm this conclusion and may further explain the development of Van Eyck’s architecture as oscillating between these two fundamental elements of his design approach.

The answer to whether or not Van Eyck links the perception of space to space formation is more complicated than in the case of Gropius; Van Eyck’s link is exclusively present in an indirect way because, in his approach, the moment of perception dissolves in the form of two spatial sensations into an all-encompassing ‘interiorization’ of space (and time). The sensuous perception *of* space thus transforms into sensuous (self-)experience *in* space. As a result, the creation of (a configuration of) ‘in-between’ spaces—thus, architectural space formation—is not conceived as an object of aesthetic perception, but rather as a medium of this (self-)experience.²⁷⁰ This specific integration of perception into the realm of (self-)experience represents—together with the corresponding approach to architectural design to enable of this experience—Van Eyck’s specific ‘functional backbonding’ of architectural design and aesthetics to the realm of use, practical life, and social reality.

As a further result, and in relation to Van Eyck’s concept of architectural aesthetics, this dissolution or transformation of the sensuous perception *of* space into the (self-)experience *in* space essentially represents a transformation of aesthetic experience (in terms of sensuous perception) into the use-related and socio-spatial realm of (self-)experience; thus, perception and use merge, so to speak. Such a transformation, however, was not a conscious decision to realise a new architectural aesthetics rather, it resulted from his strive for a new kind of integration of architectural design and human life—an integration different from that developed by the Neues Bauen.

Furthermore, this transformation is possible solely on the basis that Van Eyck also operated with a traditional, merely object-oriented concept of architectural aesthetics, otherwise he would have needed to entirely reject architectural aesthetics. In line with the already realised integration of perception and use, this concept relates architectural aesthetics, and thus the built form design, not to the use-related meaning or purposiveness of architectural design, but rather to the comprehensively determining principle of reality: the principle of relativity. Therefore, my fourth research question of whether and on the basis of what particular concept of architectural aesthetics Van Eyck linked the purposiveness and aesthetics of architectural design in a different way has already been answered—he did not do so. Nevertheless, his concept of architectural aesthetics should be explained because it represents the

²⁷⁰ Compare: Chapter 5, 5.4, Conclusion.

counterpart of that transformation of sensuous perception into the use-related and socio-spatial realm of (self-)experience. This counterpart at least potentially includes—and was previously explained in the shape of that ‘twin-phenomenological’ design—an artistic superimposition of the creation of ‘in-between’ spaces thus space formation.

Van Eyck’s concept of architectural aesthetics

In line with the orientation of his concept of architectural aesthetics on the design of architectural form, Van Eyck uses the term ‘aesthetic’ in relation to the (con)figuration and material appearance of the built form or its colouring. Here, as with Gropius, perception is exclusively present in an implicit way, as each architectural design necessarily implies the perception of a corresponding effect. At the same time, and again in line with Gropius, this object-oriented concept of architectural aesthetics includes the design of space—that is, the space-*designing* effect of architectural form. Again, although in a different way, Van Eyck focused on the determining influence of colour on this effect. In 1953, together with Dutch artist Constant Nieuwenhuys (1920–2005), Van Eyck wrote a short text on this subject. The authors therein argue against the use of colour as a mere corrective and in favour of a use that is oriented towards a mutual enhancement of the aesthetic effect of form and colour:

Space form and space colour can only form an indissoluble unity when they come into being simultaneously and form mutual relation. What holds true for painting on a flat surface also holds true for the spatial conception of colour: colour is nothing but the colour of form and form is nothing but the form of colour. A spatial conception of colour thus implies more than the use of colour for the activation of architectonic space. The complete unity of form and colour, i.e. the purely plastic use of colour, brings the architect into the field of painting. Architecture will no longer first and foremost be based on abstract form elements but be conceived as a visual reality wherein form and colour are one; and painting will no longer make colour subservient to personal expression but will take part in a plan and operate directly in a plastic way.²⁷¹

Furthermore, Van Eyck’s and Gropius’s concepts of architectural aesthetics share an intrinsic link to the former’s overall approach to architecture. As mentioned above, for Van Eyck, the principle of relativity had a similarly determining influence on architectural aesthetics as the Industrial Age did for Gropius in that it represented the overall principle of reality. Here, and in line with the fundamental ambition of the artistic avant-garde of the early twentieth century to recognise, reveal, and visualise a

²⁷¹ Van Eyck [1953] 2008, 96.

deeper level of reality, Van Eyck aimed for the timeless and hence absolute nature of reality.

The previous chapter explains how Van Eyck linked the principle of relativity with the realm of artistic design in the form of what I describe as his ‘twin-phenomenological’ design approach. In addition, Van Eyck discussed such a design approach—particularly the twin phenomena of ‘part-whole’—as a special concept of aesthetics: the ‘aesthetics of number’, which also illustrates the specificity of his object-oriented approach (or concept of architectural aesthetics).

Aesthetics of number

The concept of the ‘aesthetics of number’ represents Van Eyck’s only discussion of architectural aesthetics wherein the term ‘aesthetics’ itself appears. Under this title, Van Eyck problematises the repetition of similar and dissimilar elements as well as the resultant monotony as an essential problem of architectural (form) design, referred to as the ‘problem of number’ in the context of his ‘configurative discipline’ concept and in its application to the mass production of dwellings. At the CIAM meeting in Aix-en-Provence in 1953, Van Eyck had already claimed that:

*Projects should attempt to solve the aesthetic problem that results through the standardisation of constructional elements; through the repetition of similar and dissimilar dwellings within a larger housing unit; through the repetition or grouping of such housing groups...*²⁷²

Concerning the solution to this problem, he refers to Swiss painter and graphic designer Richard Paul Lohse (1902–1988) and his attempt to develop an artistic approach that realises—at the level of graphical art—‘*the identity of freedom and order*’, which Hans Heinz Holz defines as being the core of Lohse’s approach.²⁷³ As mentioned above, the ‘aesthetics of number’ finds its artistic counterpart in the implementation of the twin phenomena of ‘part-whole’. Van Eyck particularly assigns an aesthetic significance to this twin phenomena wherein a rhythmic and vivid arrangement of the parts within the whole and the corresponding neutralisation of the monotony of mere repetition must artistically realise the identity of the part and whole.

Although Van Eyck himself explicitly linked the ‘aesthetics of number’ concept to merely one project (the schools in Nagele), it seems obvious that all the buildings that have been described represent an artistic implementation of this aesthetic principle by means of the implementation of the twin phenomena ‘part-whole’ in one

²⁷² Van Eyck [1953] 2008, 250.

²⁷³ Holz 2002, 9.

way or another—from a rather modest manner, integrated into the given space formation type (the Sonsbeek Pavilion), to a quite strong and dominating manner that thus superimposes the present space formation type (the ESTEC extension).

7.3 Final Considerations

From the perspective of my thesis of the socio-spatial aesthetics of space formation, Walter Gropius's and Aldo van Eyck's views on architectural design and aesthetics lack an actual concept of the sensuous perception of (architectural) space in two different ways. Correspondingly, they differently lack a concept of sensuous perception's significance to architectural space concerning the integration of the socio-spatial meaning of space formation in the aesthetic experience of architecture.

What makes Van Eyck's approach so interesting in this respect is that space formation's socio-spatial meaning nevertheless takes centre stage in his understanding of architectural design and that he explicitly mentions the sensation of spatial enclosure and openness. Owing to a traditional (object-oriented) concept of architectural aesthetics, however, the realm of sensuous perception remains separated from architectural aesthetics and dissolves instead within the realm of (self-)experience *in* space. In this vein, what occurs in Van Eyck's approach is an opposite kind of integration. The socio-spatial meaning of space formation does not become integrated into architectural aesthetics by means of the perception *of* architectural space; rather, both the socio-spatial meaning of space formation and the perception—or sensation—of space become integrated into both the experience *in* space and what Van Eyck regards as the fundamental purpose of architectural design: the 'interiorization' of space. As a result, in Van Eyck's approach to (architectural) space, space formation's socio-spatial meaning is *not* conceived as content that becomes aesthetically effective; rather, it is conceived to become directly socio-psychologically and socio-spatially effective. Regarding the previously explained interrelation between the realm of aesthetics and that of use, practical life, and social reality, the intermediate step of space formation's aesthetic effect is missing. One may argue that, by rejecting the modernist notion of space, Van Eyck overlooked the architectural-aesthetic meaning of (enclosed) spatiality and its sensuous perception. The contradiction in Van Eyck's approach is that the perception of space is herein nevertheless integrated into this alternative 'functional backbonding' of space formation.

Despite this contradiction, Van Eyck's approach is so interesting and valuable from the perspective of my thesis of the socio-spatial aesthetics of space formation

because it confirms that, without overcoming a mere object-oriented concept of architectural aesthetics, a true integration of the aesthetics and the purposiveness of architecture cannot be realised. This true integration is, or rather would be, an integration wherein the aesthetics of architecture neither dissolve into nor superimpose the purposiveness of architectural design.

Concerning this issue, I would like to again point to the significance of August Schmarsow's aesthetic approach to architecture, which is characterised as just transcending a mere object-oriented concept of architectural aesthetics. Moreover, and as stated above, the general significance of this approach is also based on the fact that it may contribute to a more thorough understanding of how we perceive the socio-spatial meaning of space formation and, accordingly, a more thorough understanding of its integration into the aesthetic experience of architecture: Just as we perceive the purely spatial content of a space-forming structure by means of its immediate visual and corporeal experience, we also perceive its socio-spatial meaning in a similarly synthetic way.

In relation to Walter Gropius's and Aldo van Eyck's approaches to architectural design and aesthetics—and in addition to the described development of a *'funktionalen Rückbindung'* of architectural design—the existence of this approach at the very beginning of the century reveals a particular shortcoming within the development of modern architecture in the first half of the twentieth century. The Neues Bauen's shortcoming (including Gropius) is that its members failed to continue developing the theoretical examination of architectural space and its formation at the beginning of the twentieth century. In particular, its members did not adopt Schmarsow's theory of architecture as *'Raumgestalterin'*, but architectural aesthetics rather remained merely object-oriented and formal aesthetics.

In his 1952 article "The Paradox of Architectural Theories at the Beginning of the "Modern Movement"", architect and architectural historian Paul Zucker had already come to a comparable conclusion by stating a fundamental difference between the *'first generation of twentieth century architectural thinkers'*²⁷⁴ and the Modern Movement. According to Zucker, this difference was primarily a distinct opposition between theory and practice—between an art-theoretical focus on form and space and a design-related focus on functional expression. Zucker concludes his article with the challenge that post-war architects *'to express in their creations those ideas which were the intrinsic problems of the theoreticians of the first decades of our century'*.²⁷⁵

²⁷⁴ Zucker 1952, 13.

²⁷⁵ Ibid., 13.

The shortcoming of the Neues Bauen (or the Modern Movement) in not taking up Schmarsow's theory of architecture as 'Raumgestalterin' was definitely not the result of an opposition between art-theory and design-practice, but was rather rooted in the discourse itself. As described in Chapter 2, Paul Frankl and Leo Adler, who were clearly associated with the Neues Bauen—and who referred to and connected the purposive, use-related function of space formation with the aesthetics realm—had already disregarded essential insights of Schmarsow's perception-oriented approach. This also applies to Herman Sörgel's theory, within which the individual perception of (architectural) space took centre stage and on whose basis Walter Gropius developed his own approach to architectural space. In this sense, if we may identify a 'paradox of architectural theories at the beginning of the modern movement', the paradox is rather within that 'first generation of twentieth century architectural thinkers' themselves, which also suggests Zucker's own position within this generation because he aimed to continue developing Schmarsow's theory of spatial perception in a use-oriented direction.

Nevertheless, I would like to apply Zucker's concluding challenge, addressed to the architects of the second half of the twentieth century, on the present situation and invite both theory and practice to focus once again on space formation, that is, its double identity, and the resultant significance with regard to the aesthetics of architecture.

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After his first study, Oliver Sack worked as an architect in architectural offices in Aachen (Klinge & Hausschopp) and Berlin (Rüthnick Architekten) where we was engaged in designing and realising diverse small- and large-scale building projects. In 1997 he moved to Amsterdam where he worked - next to a short collaboration at the office of Herman Hertzberger - on a large number of housing projects in inner-city and suburban districts (Bentham Crouwel, John Buijs Architecten).

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