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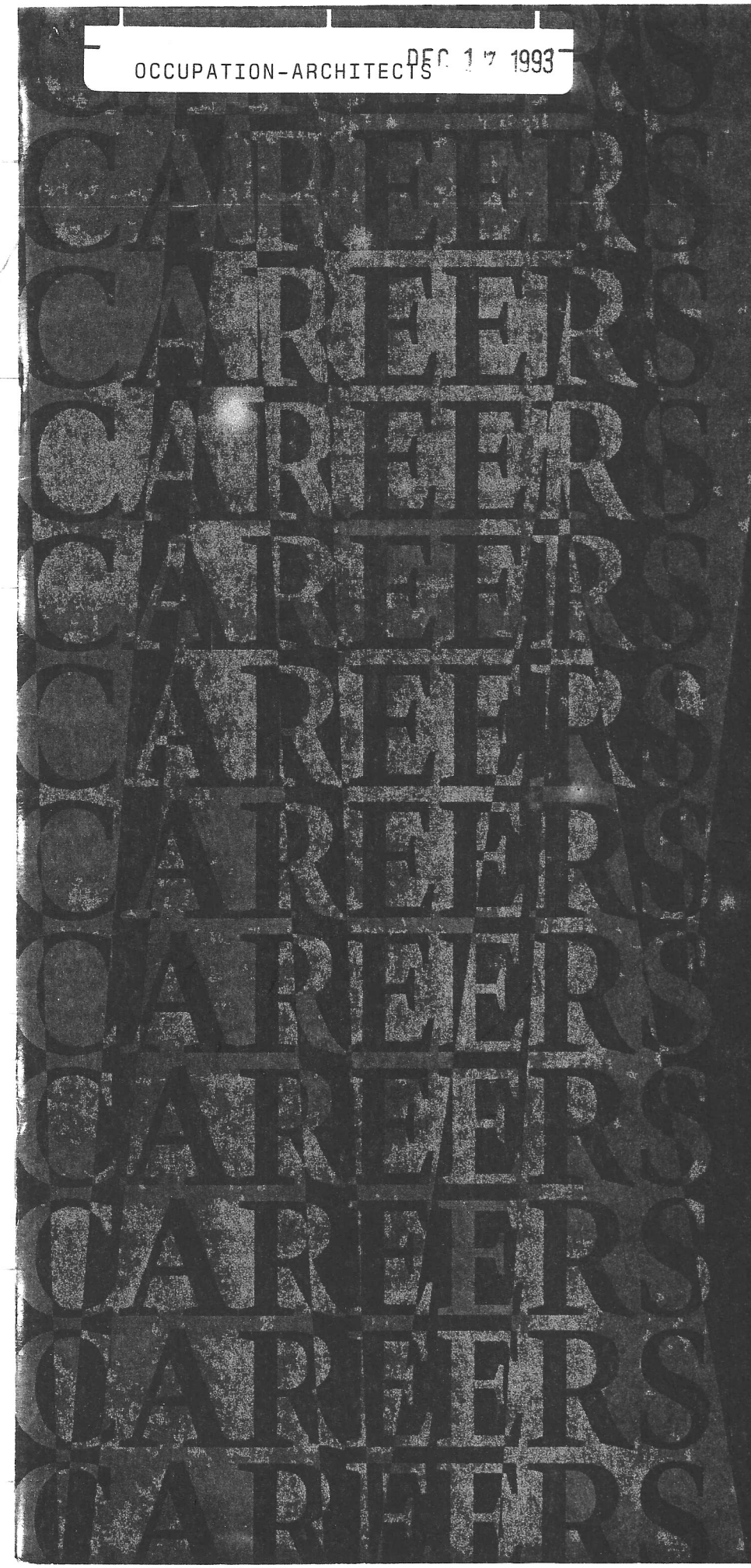

CAREER AS AN ARCHITECT

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CAREER AS AN

ARCHITECT

- *Peals of laughter and merriment sound from an ice skating rink where skaters can relax in the space between two huge skyscrapers dominating the New York skyline.*
- *In Montreal, a complex of retail stores, offices, and restaurants is filled with thousands of shoppers, office workers and visitors in an enclosed indoor plaza.*
- *In suburban Chicago, a large residence with wooden ceilings and walls, a stone fireplace, and a brick hearth and handmade furniture blends in harmoniously with the interior architecture.*
- *A feeling of flight is conveyed through a series of dynamic curved forms in a newly built airline terminal in New York.*

These are all dramatic examples of how architecture helps to make the world we live in more effective in fulfilling the needs of both workers and residents.

ARCHITECT — THE MASTER BUILDER

ARCHITECTURE IS DEFINED as a way of thinking about the environment, or the world we live in. Architects are highly trained professionals who are concerned with our environment, how we use energy and solar resources, and how we use the land.

The term architecture itself comes from the Greek word, "architeckton," or chief artificer or master builder, a very apt title, since in one person, the architect performs the function of the master builder. True, to carry out his or her work, the architect relies on a very important supporting team consisting of engineers, urban planners, landscape

architects, construction contractors and a host of construction tradesmen such as carpenters, electricians, brick masons as well as bankers, building product companies and many others too numerous to mention. While relying on many others in carrying a building project through to completion, the architect offers unique skills in design, planning, selection of materials and generally coordinating work. Truly, the architect is the captain of the building team, or the master builder, just as a doctor relies on the services of nurses, therapists, dietitians, social workers and a host of others in helping to guide a patient from illness to good health.

According to the American Institute of Architecture, the main professional society for architects, there are about 85,000 licensed architects in the United States. Of these, approximately two thirds are in private practice, either employees or partners of private architectural firms. The remaining third are employed by corporations, institutions, government agencies, colleges and universities and many other organizations.

Architects, with their special skills in managing building construction, estimating building costs and selecting building materials, as well as in design of buildings, can be used by building contractors, developers of land and property, urban planners, engineering firms and many other companies.

Because of this, the architect has many options to follow in pursuing his or her career. Even if one chooses to go into private practice, an architect can specialize in design and drafting, or can lend the talents and skills to sales or job development, to help manage the office, or to concentrate on some other phase of the business, construction drawings, schematics, and artistic renderings.

Architects, it should be noted, are involved in a wide variety of construction projects: from houses and residential complexes, to schools, hotels, hospitals and medical centers, stadiums, civic centers, sports complexes, office buildings and churches, temples and mosques. Architects also help to plan and design monuments and shrines to various historical and important events, such as the Vietnam Wall and the Holocaust Museum in Washington, D.C. Truly, to a very large extent the beauty and quality of life of our communities depend on the quality of its architecture.

While appearance — how dynamic or how striking a building looks, for instance — is an important characteristic of architecture, it is not the sole measure of good architecture. For example, an architect may design a building on a campus which looks clean, modern and majestic, but unless those working in the building or the students attending the university feel comfortable in their environment and can work efficiently in it, the building has failed architecturally. The same can be said about the building if the ventilation or electrical systems prove insufficient for the uses to which they are intended or if the building has been found to be not in compliance with zoning requirements, environmental pollution regulations and a host of other rules. So you can see that architecture is very important in our society and while the architect cannot be skilled in all phases of building design and development, he or she must have working knowledge of all of the various forces which affect the design, and how to blend all of these forces into one harmonious and pleasing architectural whole.

THE ROOTS OF ARCHITECTURE

ARCHITECTURE, AS WE KNOW IT today, is believed to have appeared first in Mesopotamia, the ancient land now known as Iraq.

The Babylonians and Assyrians who lived there variously were concerned with living for the moment, and their architecture reflected this — consisting as it did primarily of lavish palaces and other structures reflecting everyday pleasures.

Since Mesopotamia had abundant supplies of clay, water and sunshine, but little stone or wood, sun-dried clay brick was the primary building material. Most of these brick surfaces, which are easily molded into decorative shapes, contained bas relief carvings or friezes depicting events in the history of their civilization.

Had they known of the arch, they could have vaulted much larger spaces than they did, even with brick. As it was, it was the Romans who first used the arch successfully around 700 B.C.

But much, much earlier the Egyptians, whose belief was almost completely opposite to the Babylonians, contributed a great deal to the development of architecture. It was their belief that everyday life was largely a preparation for life after death, and consequently the Egyptians were preoccupied to a large extent with shaping tombs in the form of pyramids and large rooms hollowed out of solid rock hillsides.

Stone, a building material of great strength was used in large quantities by the Egyptians in building post and beam structures of great mass and height. The dry desert climate has preserved many of these Temples and Tombs as architectural masterpieces to this day.

It was in the Greek Empire's Hellenic period (roughly from 700 to 146 B.C.) that architecture had perhaps its greatest flourishing. The Greeks' sense of beauty and proportion was nowhere more fully realized than in their architecture. Buildings were beautifully proportioned and detailed in great simplicity and harmony, largely through the use of marble, a strong and beautiful building material which lends itself to precise detail and surface treatment. Under this culture, such masterpieces as the Acropolis and the Parthenon, came into existence and exist to this day.

Withdrawal and protection from marauding bands of thieves and robbers were the concerns of people during the Middle Ages, also known as Medieval times. During this period, roughly from 400 to 1100 A.D., citizens lived in heavily fortified cities or crowded the massive stone walls of monasteries or castles for protection.

Toward the end of the Middle Ages, in the early 1200's, the need arose for greater communications and travel between cities. People developed a new awareness of the world around them and interest in the natural world which surrounded them. This new age of questioning and openness, which we call the Renaissance saw the renewed interest in Greek or classic architecture. The period from about 1300 to 1900 was characterized by exploration and colonization of the Western Hemisphere. During the same period the various monarchies of Europe competed not only for land and the control of the seas but in the grandeur of their architec-

ture, a period which saw the creation of such architectural masterpieces as Versailles, Windsor Castle, and El Escorial.

In modern times, the period since the end of World War II has seen many changes in the way we look at our physical environment. In the late 1940's there did not seem to be any kind of a challenge which could not be surmounted and we have seen the development of new interstate expressways, the regional shopping center or mall, the international airport, integrated oil complexes, the nuclear power plant, huge theme parks such as Disneyland and Disney World.

The 1960's and the 1970's saw people reacting, sometimes violently, to traditional cultural institutions. This was the period which saw the birth of the conservation movement, the equal rights movement, the move toward greater racial equality, and other world concerns, and this was all reflected in our architecture.

In this century, architecture throughout the world, but especially in the United States, has been greatly influenced by two men: Louis Sullivan, who with his partner Adler designed the Carson Pirie Scott Building and the Auditorium Theater and Hotel in Chicago, and by perhaps the most influential and distinguished architect of modern times — Frank Lloyd Wright, who coined the well-known architectural expression that "Form must follow function." In other words if a building is to be a college or university then its design must be done in such a way as to make for a more effective environment in which to study.

AN ARCHITECT'S DUTIES

TO A GREAT EXTENT WHAT you do in an architectural firm will depend on your particular specialty or interest. For example some architects are more interested in customer relations or developing new business — hence they may devote the larger part of their energies to this phase of the business.

Others may prefer the creative aspect of architecture and devote their efforts to the drawing board, coming up with artistic and structurally sound creations, based on discussions with the clients and other executives from the firm who work with the client. Still other architects spend the greater part of their time and energies checking out requirements of zoning, code regulations, and regulations pertaining to heating and ventilation, electrical systems, plumbing, and infrastructure, especially in a large project. So you can see the work is quite varied and offers many options depending upon your interests and talents. But in general, the work that flows through the architectural office, where most architects are employed, follows along four stages, as outlined by the American Institute of Architects: schematic design and predesign studies, design development, construction documents, and the building or construction phase itself. Let's examine each of these stages in detail:

Pre-design and Schematic Design Studies

Here you as the architect must translate the owner's requirements and needs (helping the owner to a realization of his requirements is often a part of this step), into a logical building plan, taking into account information on the site and budget. But to do this you most likely will need to do an artistic sketch or rendering of the building, and an explanation of the design so that the client can understand what is involved.

In arriving at a pre-design, you must also consider a host of factors such as city, county or state building codes, and zoning requirements as to the type of building, fire resistive construction, legal restraints, as well as structural and mechanical requirements so that the pre-design can actually be put into effect after you get the client approval.

Here you must develop a proposed construction budget so that the client can intelligently plan for financial requirements.

Preliminary Design or Design Development Studies

Once the initial plans have been developed, the work really begins. You must analyze requirements for the site and surrounding areas, utilities, laws, codes, ordinances and soil reports, and confer with federal, state, municipal and other agencies when necessary.

A lot of work is involved in preparing the creative design. Schematic drawings must be translated into specific plans detailing form, design, and grouping of the structure and its relationship with the surrounding area. Then you must do an analysis to determine structural, mechanical and electrical requirements.

Construction Documents

Upon approval of the preliminary design, construction documents are prepared showing location of materials, construction and detail features. The documents also provide specifications of materials and methods to be used for the particular work and specifications for general work, mechanical and electrical systems, structural work and site development.

Next you file these documents for approval from proper federal, state or local agencies and these are then coordinated with general drawings.

These then form the basis for soliciting construction bids and negotiations with contractors to put up the actual building. You then take the bids which are usually sealed, tabulate them and select the winning contractor.

In this stage, it is worth noting that computer assisted design (CAD) is being used increasingly by architects to prepare the construction documents. CAD improves the speed and accuracy of the drawings detailing all basic architectural, structural, plumbing, heating, cooling, electrical and other mechanical systems. Other CAD prepared drawings may show interior space arrangements, cross sections, and building elevations. Accompanying the plans is a book of specifications detailing materials to be called for, methods of installation, and other requirements.

The Actual Construction

After a contractor has been selected and a building permit issued, you act as the owner's agent and visit the job site in all stages of construction — your primary concern is to make sure that the contractor is following through on all job specifications as shown in the building plans and documents.

Here you would check detailed shop drawings, check the progress on the building and authorize contractor's requests for payment, and okay any additional work which may not have been foreseen.

In this phase of the work, it is important that you be fair and professional in all of your dealings. While representing the rights of the client, you must also process payment requests swiftly and make certain that the contractor is aware of any problems which may arise so that these can be corrected smoothly and expeditiously.

The main interest of all concerned is to make sure the building is completed on time and within budget.

Upon completion, you issue a list of items to be corrected or completed (known as a punch list). When this is done, a certificate of completion is issued and final payment is authorized.

You should understand that this is just a basic description of the work. A complicated building project could require more delegations of duties and much greater emphasis on specialization. In a large office, you would probably specialize on some portion of the project, perhaps on the elevators or the lobby, for example, and you might seek to develop special competence in some part of the practice as a consultant in an allied profession such as mechanical, structural, or civil engineering, landscape architecture or environmental planning.

Other areas in which you might specialize: conceptual and preliminary design, interior design, production supervisor, specifications writer, and construction inspector. Ultimately, however, there is one architect responsible for the overall design and development of the project.

If you have your own architectural firm, you are also called upon to apply sound business principles to the operation of the firm. You would have to have some idea of accounting, personnel management, tax matters and other business matters.

You would also need to be able to understand contracts, write specifications and prepare drawings to conform to legal requirements and to protect your client as well as yourself, as the chief architect.

Because the work is so complex and important to the public safety, health and welfare, all 50 states require that architects be licensed.

To see how all of these various parts of the architect's work fit together, let's see how they apply on one job — the construction of a new high school.

Architect's Project: A New High School

The local school district has decided to build a new high school and your firm has been hired to handle the project. You are to make studies on location, function and cost of the school. Often such public agencies as school boards, employ architects to handle in-house services on school buildings. They also

work with private architects in handling major building projects.

In making studies on location, the architect in charge will most likely work with local city planning commissions on plans for neighborhood development. Urban planning is a challenging field for those with architectural training.

As the architect studies the various activities to be conducted in the building, he or she may call in a variety of consultants, many of them trained architects, on special functions such as computers and team teaching, auditorium and stage design, gym construction, and visual aids. Some architects and architectural firms specialize in particular kinds of buildings — schools, churches, hospitals and many others. Others specialize in some particular area of the building, such as kitchen and cafeteria, hospital operating room, auditorium, x-ray area, and so forth.

Having approved the school's construction, the school board instructs the architect to bring in detailed drawings and specifications for the building's construction — the construction documents. To do this the architect calls on the services of many skilled professionals, both from the firm's own staff and from the ranks of private consultants such as architectural designers, structural, electrical and mechanical engineers, specifications writers, draftsmen and many other skilled personnel.

As part of the design team you may also want to call in representatives or salespeople from various building materials companies for their input. Such consultants represent yet another option for people with architectural skills.

You would then check the drawings and specifications with various public agencies, state, local and national to make sure that the building design conforms to code. Such agencies who are in charge of developing and administering building codes often employ architects on their staffs.

Next comes the bidding process in which various building contractors review the construction plans and specifications, estimate the cost of labor and materials and submit a bid to do the job.

Construction management — scheduling of construction, estimating and controlling the cost, and coordinating the various operations involved, is yet another source of employment for architects, especially for more complex projects where the architect's special cost estimating and construction skills will be necessary.

Following construction, which can take anywhere from 12 to 18 months, during which the architect is very closely involved, there are many decisions to be made. These would involve site improvements, landscaping such as athletic fields and courts, playground equipment, access roads and parking lots, and many other improvements.

Still remaining are many important features relating to interior design, furnishings and equipment. In all of these phases the architect is involved either as the project coordinator or as a consultant.

The above scenario will give you some indication of the complexity of one job and the scores of skills and talents called upon, all of which the architect is called on to control and coordinate.

GET INTO THE ACT — RIGHT NOW

FROM THIS DESCRIPTION OF the work, does architecture sound like it might be something which would interest you as a career? If so, there are many things you can do right now to pave the way for the day when you finish school and are licensed as a practicing architect.

To begin with, it would help a lot to get into architectural school if you had a solid arts and sciences background. Also, you should have the ability to conceptualize — see an object in space, a pattern, a method or plan — in short, the ability to see a problem as a whole. But if you are not so strong in mathematics (or drawing or writing), you might still become a good architect, for there are many options available to architects which do not depend so much on drawing and mathematical skills.

Freehand drawing talent is much more useful than drafting ability. In general,it is better to have a comprehensive liberal arts background than a drafting background in preparing for an architectural education.

Local chapters of the AIA (listed in the phone book) can be an excellent resource on information about the profession. AIA members (through the chapters) can put you in touch with architects who can talk to you about the career. Also, visit architectural schools in the area and talk to faculty members and students about the school's philosophy and required courses. Many schools of architecture offer summer programs for those interested in getting firsthand information about the architectural curriculum and demands.

Admission to most architecture schools is very competitive and based on your high school grades, class rank, aptitude in architecture and achievement scores. Most schools require a review of your portfolio for admission. And it doesn't matter if you are a high school senior, a college graduate with a different major, or someone from another career field, a portfolio is important since it can show a sense of your creativity and your unique strengths and talents that you can bring to the school.

Schools are seeking students with broad talents, creative ideas, and clear thought processes. Think of your portfolio as a design project, which calls on your best talents whether they be in painting, photography, writing, cooking, clothing design, or some other area which may indicate your special talents.

Finally, check on any print or audiovisual materials your school library may have on the field — particularly on the career aspects of the field. Cultivate any artistic talents you may have by joining and being active in such clubs as an art club or photography club. Photography relies on such talents as composition and balance and so does art or drawing, all important in building design.

You might also experiment by building scale models of buildings using various construction materials, starting with inexpensive model kits and progressing to the design and building of original models.

ARCHITECTS DISCUSS THEIR PROFESSION

Consultant in Architecture

"The university I was educated at was excellent. In fact, one of the principals of our consulting firm was one of my profs at the University and we are still associated after all of these years.

I finished my schooling and graduated in 1955. At that time architecture was a four-year program. But now it is a five-year program and will probably be expanded to six years in the future.

There were only two options available then — engineering or the design option. After the second year, the program varied according to which option you were following.

There was, and still is, a three-year internship before you could take the state exam for licensure, but I had worked several summers while in school, so I was eligible to take the exam in 1956, just a year after I graduated. I took and passed it the first time. It's a four-day exam, over 36 hours, very strenuous and stressful. It's quite unusual for anyone to pass it on the first try. Often students take it three or four times. But you only have to take those sections which you have failed, so that makes it easier. I then joined a practice which had been started by one of my classmates the previous year and we became partners and were associated in practice until 1991, when we closed the firm. Now I am with a consulting firm which we had started in 1980, with my former college professor as an associate. We work with anyone who has a problem relating to the building industry. It could be someone with a building with several problems such as a roof leaking, masonry cracks, etc. We consult with the building owner or the contractor to resolve these problems to see what caused them. We also do inspections of large building complexes which are on the market. Prospective buyers require a systematic inspection of the property to see if there are any serious problems in construction or maintenance.

I became involved in architecture when I was in high

school. I loved drawing and noticed by accident that there was a room full of people drawing and found that it was a course in architecture so I enrolled in it immediately and had two years of architectural design in high school which were along the lines of what was being taught at the University, so I was well prepared for college work.

In our practice we specialized primarily in industrial work. Architects tend to specialize because that is the work which seems to come to you through the connections that you make through friends, associates and so forth. A certain line of work comes in and as you do more and more of that kind of work, the work migrates to you. Any architect who is properly trained can do any kind of work — schools, offices, industrial, fire stations, residences — any style of architecture, but the public's perception is that an architect cannot design a school unless he has done schools in the past, so they will seek people out with experience in this field and that's how specialties come about.

We have designed well over 2,000 industrial buildings in the 35 years of our practice. But in the consulting business, it's not so much our experience with any special kinds of building as it is experience and knowledge of building problems and all of the technical aspects of architecture. And over 35 years we have learned a great deal about the technical and the bureaucratic aspects of the work.

Unfortunately, you are never told exactly what your duties will be in practice by those involved in your education. Perhaps they do not want to discourage you from continuing. But in reality what we are taught in school is a lot different from what goes on in the practice.

For instance, there is a tremendous amount of effort to teach you the proper techniques of drawing and you spend a lot of time on the drawing board with freehand and mechanical drawing. You are also given a lot of time in design and in evaluating all of the things that go into the building's design. When you get into practice only about 20 percent of your time is spent on drawing and design and the balance is managerial and clerical, which requires specifications writing, contract writing, client meetings

and presentations, and administration of the building program.

In a large firm it's hard to get a cross section of knowledge about the building program. Generally in a large firm the work is more segmented and specialized. You may be working primarily on stairways or elevators or lobbies as opposed to the entire building program. I recommend that early on you try to get into a smaller firm — perhaps as a summer job during school to get acclimated to what you do in an architect's office and how to do it. Chances are you will get much more of a cross section of the work because you have a variety of duties in any office of fewer than 10 people.

Once you have the experience, you will become more involved in the process of talking to clients — what it's like to do preliminary sketches and to come up with a solution to a building problem and then on to the final design and the execution of the building itself.

With experience, it's a good idea to move and to work for a larger firm to get a variety of building experiences — other types of buildings, not merely residential projects. Perhaps you will be doing more commercial work in a larger firm.

Then it's your choice. By that time you should have determined what you like about the business — what segment you are most comfortable with, and you will be better able to determine whether you want to work for a small or large firm. You might want to open your own office if you have some connections which will bring you work or you may want to go with a large firm and work on larger building projects.

The greatest thing about this field is that it's creative. I know of no profession that gives you as much opportunity at creativity as architecture. Basically you sit down with a blank sheet of paper and a pencil and create a three-dimensional object that hopefully will be around long after you're gone. We have a tremendous latitude in creating every inch of space in that building — how it's built, the materials used. It's a tremendous challenge.

In practice, every project that comes in has a pro-

gram — sometimes the clients come in with the program and know precisely what they want. In other cases they do not, but may have a general idea of it. For example, a client may want to build a small office building. The person may own property on which to build the office building and may want to build as large a building as is permissible. But there may not be any idea of how big that building can be — how many stories. So the person engages an architect who will study the site, zoning and building restrictions for that property, as to what is allowable and then come up with a preliminary program or design. The architect will do the building just as high as possible and provide space for parking for so many cars. And storm water retention will be needed and many other requirements. The architect would list all of the technical problems mandated by the building and zoning codes, and these would have to be solved in the preliminary program.

Most students come out of school and want to design buildings in a way that will enhance their reputation, but they mistakenly think they know everything there is to know about building. But the young graduate has just touched the tip of the iceberg. This beginner has not yet learned the economics of building — how for instance to select structure systems, building materials and methods of application. This person knows very little of the problems that you may run into — leaking roofs, walls.

It make take a few years, four years, ten years before the first real opportunity to design a building since an architect must learn all of the other aspects of building design, codes, zoning restrictions before being qualified.

Right now, most buildings going up are municipal buildings — fire stations, police stations, schools and the like. But no question, as the economy goes up, demand for buildings goes likewise. Population is still exploding so there will be a constant need for new cities, new shopping centers, new housing projects, factories, office buildings, and so forth. The more diversified you are, the more able you will be to survive economic downturns. Industry always rebounds and with it comes a need for buildings and people to do these buildings."

Principal in Small Firm of Five Employees

"I did not decide on an architectural career until I got into high school. I had always leaned toward the building industry. In high school I worked for a store that did residential installations of electrical and heating systems. I took technical courses in high school — electric shop and so forth. In my last two years I had to make up several courses which I needed to qualify for college, including language. I did take four years of drafting and all the way through high school, my instructors were encouraging me to go into architecture.

While in architecture school, I worked part time for one of the professors and planned to interview for a position with the firm when I graduated. But the professor told me to stay on for the summer after I graduated and that I could have a job there until I found one on my own. The professor was a consultant to a firm which was a sponsor for Mies Van Der Hohe, then director of architecture at the school that I attended. So I had the rare opportunity to study under Mies, who was world-renowned, on some of his buildings.

I remained with the professor's firm for a few years and then went to work for one of the major firms in the business, where I stayed for over 20 years. I started as a drafts person and designer, and then was promoted to project architect, project manager and a vice president. We were a large firm specializing in commercial, institutional work and offices and multi-family residential complexes. As a draftsman I started doing drawings showing how ceiling tiles would work out on a new office building.

I left to start my own firm, and we do commercial work and the kind of large institutional projects that I am familiar with. I still do that, but our main work recently has been residential additions and remodeling of older residences.

My field of expertise is in taking old residences, adding to them and blending the new parts with the old so that it looks like one unit. We employ three architects, a drafts person and an office manager.

Most firms specialize in one area of architecture. One

of our local members specializes in churches, and one of the largest firms specializes in hospitals. Another firm might specialize in industrial structures and another in multi-family residences. Some firms with engineering capabilities specialize in nuclear plants or airports. Just about any industry has architectural firms who specialize in that particular industry.

At my former firm I did a variety of projects. At one time we had five divisions and I was the group vice president in charge of our commercial, housing and business division. We also had a warehouse division, food processing division, office division and so forth.

Internship has always been a requirement to practice architecture. Usually you have five years of architecture school plus a three-year apprenticeship, or internship. Now a new kind of internship — IDP — Individual Development Program has been introduced in the profession. Many states have it, and its a more structured kind of internship. It's still three years, but calls for a variety of points obtained in various architectural activities — designing, specifications writing, producing working drawings, and so forth.

Everyone has to take the registration exam in your state for licensure. The pass rate is low — only about 20 percent pass it the first time, but you can repeat again taking only the parts of the test that you have failed. There are about nine parts to the test which lasts four days and includes such things as history, structure, mechanical systems, office practice, graphics, design, and so forth.

You are notified if you have passed and you can then apply for your state license. If you want certification from the national body — National Council on Architectural Registration Boards — which is accepted for licensure by most states, you must obtain a couple of sponsors, pay a separate fee, and you then qualify for national certification.

Once you have your license all you need do is to pay a renewal fee every two years. There is some talk now of making continuing education a requirement for continuing your licensure. But in anticipation of the time when this is a requirement for licensure in each of the 50 states, the pro-

fession is preparing for this by developing programs for continuing education which will be made available to all professional architects.

In actual practice, the work in an office goes like this. You usually receive a call that a client has a project and you make an appointment to see the client. You may have competition and other times there is none. But if you are competing for the project, the client most likely will want to see what you have done and will want to talk to several of your clients. They will select the one that they feel is best for the job but may want to know what your fee will be and this is done through negotiation based on the client's needs.

Once you have the job, you interview the client and visit their facilities, their lots or whatever, and prepare preliminary designs aimed at meeting the requirements and work with the design until you come up with something that the client likes. Once the design is approved, we produce working drawings, specifications and the like, take construction bids from contractors, and negotiate a contract with the contractor. We serve as an intermediary between the client and the contractor to make sure that both get a fair shake.

Once the contract is awarded we observe the construction — there are five parts to a contract which most architects follow: schematic design or drawings, design development, construction documents, bidding and construction.

Schematics are the preliminary drawings, design development is taking drawings from their original design and coordinating with all the various systems, such as lighting — and on a more complicated building you could be involved with ventilation and other systems to make sure they are adequate for the building. You don't design any in great detail, but you make sure they work — that the electrical space is adequate and that the ceilings are okay for the duct work.

Once all of these details are worked out, you do the final working drawings. The print shop prints the drawings and you work from the blue lines.

On a small building the architect might do the entire

thing. On more complex projects, we work with structural engineers, civil engineers and may call in consultants in such things as lighting and acoustics. Now we have environmental consultants to work with on such things as asbestos when you are doing an addition to a building or remodeling it.

The licensing exam is a test of your minimum capabilities. Artistic ability is important but the building must not only be aesthetically pleasing, but also workable and functional as to the use for which it is intended. Some architects are stronger in aesthetics and others in technical ability. Some may have all-around capability. Most firms have multiple capabilities and one helps or supports the other. You might have a large firm with a design staff which comes up with the ideas and a production staff to make them work.

You might want to consider starting out and continuing with a large firm in which you probably would be working on pieces of a project, depending on your situation and talents. You may wind up in a rut working on the same kinds of piece for a long time or even for your entire working career.

In a smaller firm you would be exposed to more of the project — perhaps even the entire project very early on.

Some architects are more geared to working with clients and discussing their needs; others to working on the inside and taking the client's specs and designing working drawings based on these. Those who work with clients generally rise in the firm and may become managers and partners; others may stick to the technical part and stay in the back room the rest of their lives.

But there are many options for architects. You can work for a client and become the client's in-house architect or facilities manager. Or you could work for a contractor; government agencies often have their own staff architects. There are just endless possibilities for people who are trained as architects."

WHAT IT TAKES TO SUCCEED

OF ALL THE PERSONALITY traits required to succeed in architecture perhaps none is more important than imagination. Are you creative...are you an idea person...architecture requires the continuous development of new and creative solutions to building problems.

But more than that, the artistic temperament must be balanced somewhat by common sense. The ability to balance the creative or the ideal with a sense of what is practical and achievable.

Beyond that, the work requires the ability to communicate ideas to clients. While being able to draw can be very helpful, it is more important to be able to conceptualize visually and to understand spatial relationships.

Good communication skills — both written and oral — and the ability to work either independently or as part of a team are very important.

Knowledge of and familiarity with computers is a must since most firms use computers not only for word processing but for specifications writing, two and three-dimensional drafting and financial management. Indeed there are many software programs written specifically for architecture firms in each of these areas. In addition, a knowledge of CAD is extremely helpful since most architecture firms are already involved in this area or are planning to become involved in the near future.

Other very desirable qualities in architecture are: synthesis — can you take a welter of details and blend them into a logical, rational whole.

Perseverance — can you see a project through to completion despite irritating delays and interruptions?

Scientific ability — are you adept in math, engineering and other scientific studies? The architect is almost daily involved in problems dealing with mechanical, power, lighting, sanitary and other technological problems.

Massing — can you judge the distance between objects, and their bulk, height, length and width? The architect must have a good eye for size and shape.

Finally, how skilled are you at visualizing such things as space, color and texture — all very important in creating a work which is stimulating and pleasing to the senses.

If you can answer yes to most of the above traits or qualities than chances are you have the personality makeup which would be required to succeed in architecture.

CONSIDER THE PROS AND CONS

BY NOW YOU PROBABLY HAVE some idea as to whether this is a profession which would be of interest to you.

Here are several other considerations — both pro and con — which may help you to decide if you want to pursue this career field.

On the negative side, many practicing architects state that the actual practice is far from what they expected when enrolled in architecture school. In

many cases students enter the profession thinking they are fully qualified to handle any assignment that may come their way, when often they are not. Usually, they lack the specific experience in the practical application of their knowledge that is required to do the job.

Even those architects who have many years of experience behind them may not be fully qualified to handle all aspects of a given building project. The bigger and more complex the project, the greater the likelihood that consultants in various areas of construction — electric power, sound stages, x-ray and operating room suites in hospitals and many, many other areas — will be called in for their expertise.

If you are not careful, you can get pigeonholed in one particular segment of the job — in developing details or parts of the overall project, after the creative developmental work has already come off the board. If this is what you want — and many in the field are satisfied with this — fine. But if you want to advance to the higher and better paying jobs in the firm, you need to gain experience in all phases of the work — preliminary and developmental, construction documents, construction management, practice management, and so forth. And this can only be done if you have shown that you have the capacity to handle additional responsibility and are ready to advance to more complex aspects of the work.

Perhaps the greatest portion of the work in architecture school — is devoted to design and drafting. However in actual practice, only a small part of the work is occupied by design and development, with a major part of the work being taken up by checking out plans against zoning and code requirements of various governmental agencies, local, state and federal. This type of detail is a very important part of the job and must be completed before starting the final construction documents.

While the work can be and is highly creative, it is not necessarily the most creative or talented people who are the most highly rewarded. In many cases, those who are especially talented in bringing in new business will receive the highest salaries and will rise to positions of prominence in the firm most rapidly.

Considering the extensive training period involved, anywhere from five to eight years of schooling, plus internship, the field is not as high paying as others with comparable requirements in schooling. It has been said that you do not enter this field primarily for the money, but rather for the work itself.

Finally, the work is highly cyclical. During good times, there probably will be more work than the firm can handle. You may have to work overtime to handle the volume of work coming in. But in times of downturns, there may not be enough work to keep the staff fully employed; and it is entirely possible that unless you have seniority, guaranteed salary and tenure in the company, you may be let go.

There is great satisfaction in seeing your name affixed to a prize winning entry in an architectural competition, and the top ranked architects have excellent opportunities for advancement and top salaries within the firm.

EDUCATION, INTERNSHIP AND LICENSURE REQUIREMENTS

EACH OF THE STATES AS WELL AS the District of Columbia and the territories and protectorates require that you be a registered architect to practice. And to be licensed, you must complete a three-step process involving (1) education, (2) internship and (3) passing the licensing examination. Each of these three steps will be examined in detail in the following section.

Education

There are about 100 accredited schools of architecture in the United States and Canada. While entrance requirements vary from school to school, with certain requirements common to almost all of the schools, it is nevertheless strongly suggested that you write to the schools in which you are interested for specific requirements.

In general, you must be a high school graduate, ranking in the top one third to one fourth of the class or in some cases with a B average and a total of 15 to 16 units in English, Math, Science, Social Studies, Foreign Languages and other studies.

You will also need to submit your record on the Scholastic Aptitude Test (SAT). Some schools will also accept the test scores of the American College Testing Program (ACT).

Also helpful, and in many cases required, are letters of recommendation from your instructors or department heads, and other testimonial letters.

Once this is out of the way, you must now give some thought to the specific choice of an architectural school. Which of the schools would be best for you? Each of these schools has its special requirements and philosophies and you will be asked to make an investment of from five to eight years to complete your schooling and a financial investment of $5,000 to $25,000 per year, depending on the kind of school chosen — public or private — and its relative standing in the educational hierarchy. So, it's important to consider this choice carefully before you plunge in. Ask yourself such questions as how good a student are you. If you are in the top 10 percent of your class — there probably will be no problem in getting into even the finest or most prestigious of the schools.

Next ask yourself if you are ready to go directly into a college curriculum leading to a degree in architecture — in other words into a professional school, or would you prefer to have several years of general study on the undergraduate level?

You should then check to make sure the school is accredited. Here the booklet *Guide to Architecture Schools in North America* can be very helpful. To order a copy, write to the Association of Collegiate Schools of Architecture in Washington, D.C.

In particular, it is important to learn the requirements for earning a degree, what level degree you will earn and how many years it will take to do this. Also, how large is the student body in relation to the faculty? What are the study, library and laboratory facilities?

Finally, you should check the tuition and other costs of the school. What scholarships and loans are available, and how can these costs be paid?

Here your school's vocational guidance counselor as well as the architecture school's financial officer and your parents should all be consulted to see how much aid is available from the school and how much you or your parents will be asked to contribute.

In checking the requirements for the various schools in which you are interested, you should note that basically architecture schools have developed along three general lines:

- *Five Year Programs*

This is the oldest model of architectural education and leads after five years of study to a bachelor of architecture degree. Many such programs began as four year-technically oriented programs. But with the growth of technology, and the perceived need for liberal arts courses, these programs were extended to five years.

- *Graduate Professional Programs*

These are based on the belief that professional education is best when offered after completion of an undergraduate college program. These schools, like medicine and law, offer their courses on the graduate level, with students earning a master of architecture degree upon the completion of three or four years of professional study.

- *Four plus Two Year Programs*

Combines four years of pre-architectural education with two years of professional concentration and results in two degrees: a four-year bachelor's degree and a master of architecture degree. This model allows students additional time before seeking a professional career and makes it easier for students at community or junior colleges to transfer to the professional school.

It should be noted that there are various combinations of these programs in some schools, and a few schools have developed exciting programs outside the traditional university setting. Some include co-op or work-study courses into their programs.

There is no standard model for an academic course of study in architecture; each school develops a curriculum best suited for it. As a result there is a lot of variation in the ways in which the various parts of the curriculum are taught, but in general they follow these guidelines:

- *Design*

The central part of almost all architectural programs, utilizing the design studio, among others, in which projects are discussed and analyzed case by case. Here the course makes use of your skills in drawing as well as your talent in form, proportion, space and mass. In the studio, you develop schematic concepts, preliminary drawings, and models for presentation with faculty members, practicing architects acting as critics and guides.

- *Theory*

Here you study architectural theory, history, environment and behavior. Makes use of historical models and analytical studies of the past in developing an understanding of the present.

- *Technology*

To gain a working knowledge of construction, students take courses in

structural, mechanical (plumbing, heating, ventilating, and air conditioning) and electrical systems and such elements as lighting and acoustics; building materials and construction processes.

- *Practice*

Traditional professional practice courses are augmented by opportunities to study contract law, real estate, building codes, construction economics, and office and project management.

- *General Education*

It is essential for the architect to understand the nature of the world and to have an appreciation of the accomplishments of its civilizations. Schools of architecture complement professional training with general education to help stimulate intellectual curiosity and growth through the arts, humanities and social sciences.

Tuition varies considerably among schools. In many public institutions, residents of the state pay considerably less than non-residents. There are several financial aid programs including the AIA scholarship as well as various federal scholarship and loan programs which are available to qualified students.

Internship

Usually requires three years, in which the student puts the academic knowledge which he or she has obtained into practice by working as an employee in the office of a registered architect. In some cases, internships can be held as an employee of an organization other than an architectural office when the experience is under the direct supervision of a registered architect.

Usually, experience working during the summer for a private firm may be applied toward fulfilling the internship requirement.

The AIA and the National Council of Architectural Registration Boards (NCARB) have developed the Intern-Architect Development Program (IDP) to provide more comprehensive experience in various areas of architectural practice: design and construction documents; construction management and office management.

Licensure Examination

The exam is also known as the Architect Registration Examination. It should be noted that each state has its own special requirements to be able to take this exam. It is extremely important therefore that you check with the state registration board to make sure that you have fulfilled all of the requirements to take the examination.

As to the exam itself, it is usually given on the same day in most states.

This is a very difficult test, lasting four days in a row, and very few, estimated as less than 25 percent, pass the test upon the first try. In most cases you will not pass, but the good thing about the examination is that you can take it over again, and need not take the parts that you did pass; only those which you failed. It is not at all unusual to take the test several times.

Once you have passed the ARE, the state registration board will issue you a license. You are now eligible to practice architecture.

Should you desire to practice in another state, you will either have to satisfy the particular state's requirements for licensure, or you can seek reciprocity — the ability to practice in another state — by applying to the NCARB, the agency which administers the ARE, for certification. Once you have passed that agency's requirements, you can then obtain reciprocity — the right to practice — in most states, but not all.

It should be noted that the learning process does not end once you have passed the exam and are licensed to practice. To keep architects abreast of the numerous developments in the field and in practice management, the AIA offers members a broad program of seminars and courses.

WHAT YOU CAN EARN

MEDIAN INCOME FOR SALARIED architects working full-time is about $40,000 a year. The middle 50 percent make between $25,000 and $55,000, while the top 10 percent earn more than $75,000 and the lowest 10 percent, less than $20,000.

Salaries for graduates of architecture schools vary considerably depending on location, local construction, size of the firm and the individual's talents. Without a doubt, the larger firms pay a good deal more than the smaller ones, even in such beginning jobs as intern. An intern's salary typically ranges from $20,000 to $30,000.

Partners and principals in firms average about $60,000 while those in large firms can earn $100,000, or much more in the case of unusually busy and prestigious firms and celebrated architects.

While partners in well-established firms usually earn more than salaried employees in the same firm, their income can rise and fall sharply depending on business conditions.

In opening your own architectural firm, there is a break-in period, which can extend over a year or two or more, during which time expenses may be greater than income. Hopefully, as the firm becomes more well known and the business opportunities come in, this will quickly change and the firm will show a profit.

The 40-hour workweek is fairly standard in the industry. Since architects are considered experts in the esthetics and structurally sound use of office space, lighting and design, architectural offices are for the most part well-lit and well-ventilated. However, a good part of the work can be done on the job site, reviewing the progress of the project and here you can run into all kinds of weather conditions, cold or hot, rain or shine.

GETTING STARTED AND ADVANCING

THE PATH TO GETTING STARTED and advancing is pretty well defined in architecture and will vary mostly on whether you start with a small or a large firm.

While the opportunities for advancement may be greater in a large firm, it is a fact that almost a quarter of all architects are solo practitioners; 60 percent of firms employ fewer than five people and almost 95 percent employ fewer than 20 people. Also, there are only 20 firms with more than 100 architect employees in the entire United States. It follows therefore that the bulk of opportunities in the field are with small firms of five or fewer people.

In a small firm if a job arrives where there is a tight deadline, everyone may have to switch duties — perhaps concentrating on drafting one day, working on model building the next and writing specifications the day after that.

In a large firm the work is very specialized. Drafts people may never write a specification or visit a building site. Generally, advancement in a large firm means working your way up the corporate structure with the lowest level occupied by the drafts person or model maker.

With experience as a drafts person, you may be promoted to project architect in charge of the design of a specific building. With yet more experience you might be made project manager, with the responsibility of supervising several jobs. Over the project manager are senior level associates with overall responsibility for the work that the firm turns out.

At the top is the partner/owner who has the major financial responsibility in controlling expenses and cultivating income. He or she may also be the client contact person and the one who seeks out new accounts.

Of course, not all who complete architectural school stay in the field — many are attracted by related work in urban planning, real estate development (building and managing large housing or commercial projects, for instance) and serving as staff architect for large corporations, schools and colleges and various public agencies, such as the school board noted above.

The ultimate goal of many practitioners, working either for small or large firms, is to open an independent practice some day. While the rewards, both financial and professional, may be greatest working as your own boss, so are the risks. You have the most to gain when times are good and perhaps the most to lose when the economy falters.

THE FUTURE

ARCHITECTURE IS A FIELD WHICH depends almost entirely upon construction. And construction is highly cyclical. During recessions or periods of slow growth, when construction of all kinds is down, architects face stiff competition for job openings and layoffs will occur. Even in good times, there are areas of the country where opportunities are poor.

While new construction is down, rehabilitation and preservation of older buildings improves thanks to aroused public awareness of this area. At the same time because of increased expansion of the health care industry with corresponding need for new buildings and facilities, there has been a growing need for architects.

Public buildings hold their own in almost any economic climate — everything from schools and public universities to federal courts and prisons.

Because of all of these factors job opportunities for architects are expected to hold firm, and employment is expected to expand as the average for all occupations and the number of degrees granted in architecture is not expected to grow.

ASSOCIATIONS

Associations move their headquarters from time to time. For current addresses, consult a directory of associations at the library. Write to these and other professional associations in this field requesting information that will help you in your personal decision-making process.

American Architectural Forum
American Institute of Architects
Association of Collegiate Schools of Architecture
Association of Women in Architecture
National Council of Architectural Registration Boards
Society of American Registered Architects

PERIODICALS

You can find the addresses of these professional journals and magazines in a directory of periodicals and magazines at the library. You may find recent issues of some of the more popular periodicals in a large public library or university library. You can also write to the publication directly and request a sample copy and information on obtaining a regular subscription. Reading current professional journals and magazines of this type can be an excellent way of getting a feel for what is happening in the field.

Architectural Digest
Architectural Record
Practicing Architect
Professional Builder and Remodeler
Progressive Architecture

EDUCATION THROUGH READING

Plan your own personal reading program for background information concerning architecture as a career. Visit your school and public library and ask a librarian to help you locate information on this subject in the catalog files. Begin your own course of study now, in non-technical literature which you can understand. This will help you prepare for your professional education and training in this career.