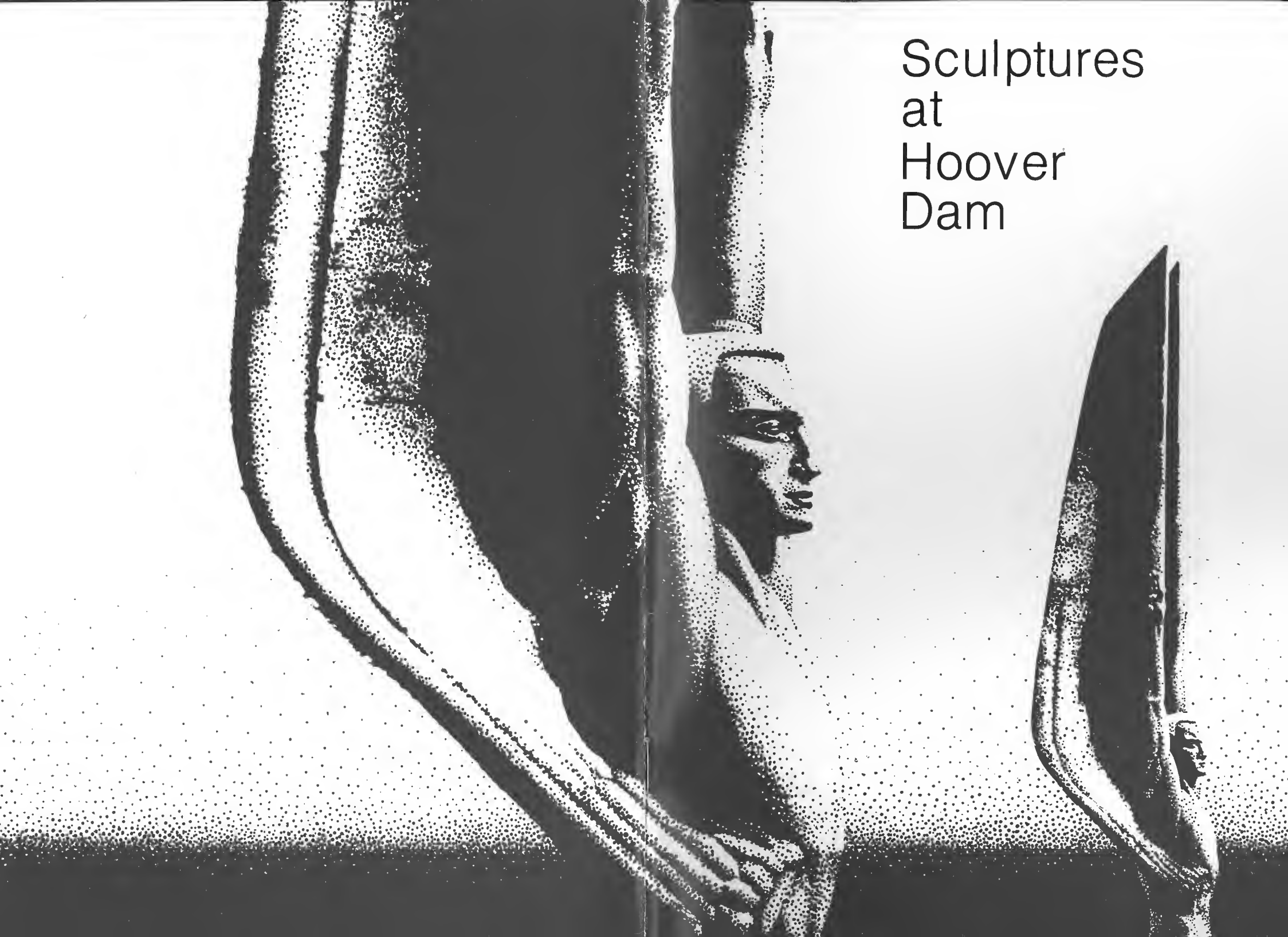
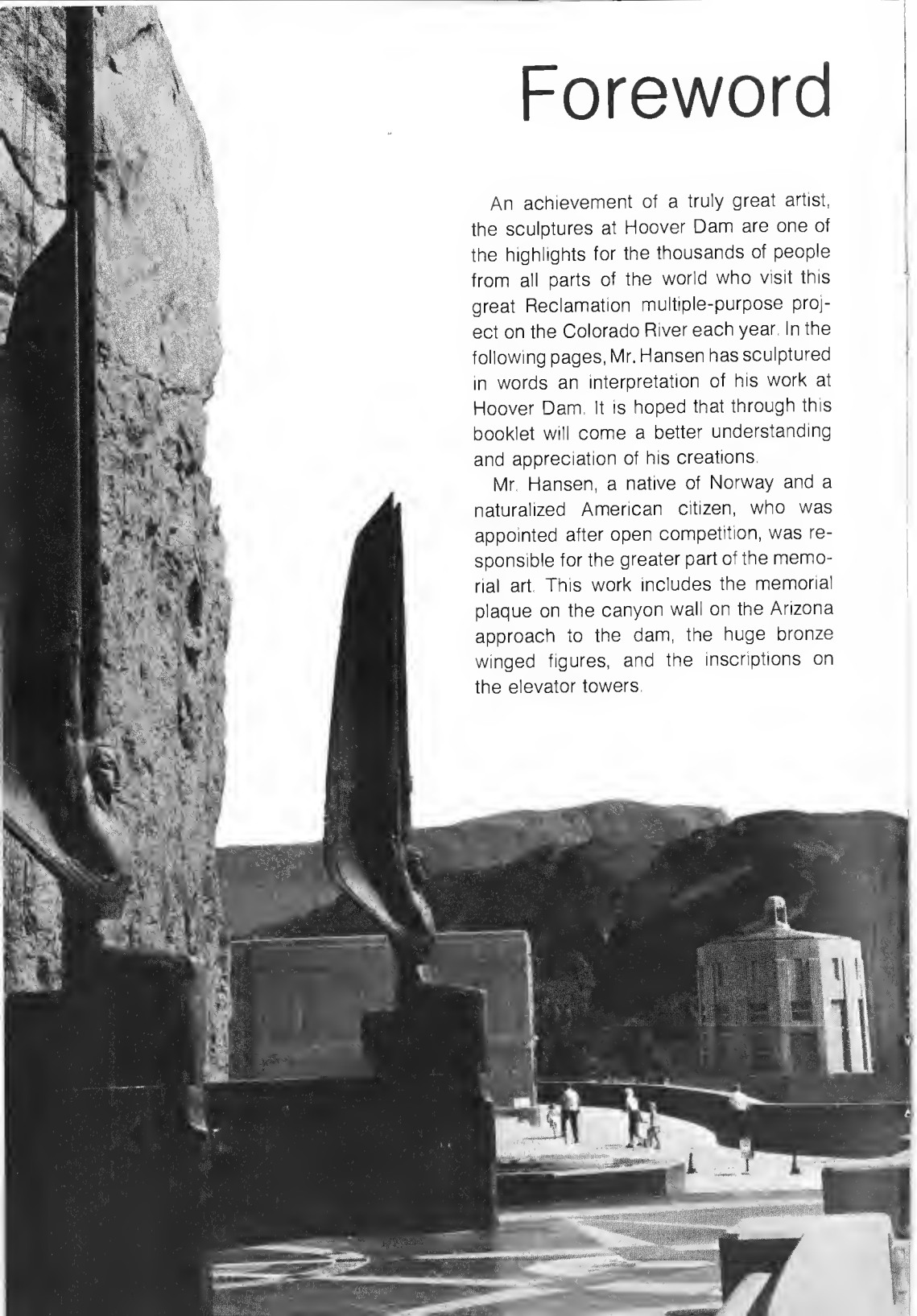


Sculptures at Hoover Dam



Foreword

An achievement of a truly great artist, the sculptures at Hoover Dam are one of the highlights for the thousands of people from all parts of the world who visit this great Reclamation multiple-purpose project on the Colorado River each year. In the following pages, Mr. Hansen has sculptured in words an interpretation of his work at Hoover Dam. It is hoped that through this booklet will come a better understanding and appreciation of his creations.

Mr. Hansen, a native of Norway and a naturalized American citizen, who was appointed after open competition, was responsible for the greater part of the memorial art. This work includes the memorial plaque on the canyon wall on the Arizona approach to the dam, the huge bronze winged figures, and the inscriptions on the elevator towers.

The principal work is located at the Nevada side of the dam, close to the abutment. Here one comes suddenly on a strikingly beautiful monument of dedication. Rising from a black polished base is the flagpole, 142 feet high, flanked by two winged figures. These are said to be the largest monumental bronzes ever cast in the United States. The castings are 30 feet high. Their shells are ⅝-inch thick and contain more than four tons of statuary bronze. As symbols they express, according to the sculptor, the immutable calm of intellectual resolution, and the enormous power of trained physical strength, equally enthroned in placid triumph of scientific accomplishment.

The base upon which the figures rest is of black diorite (an igneous rock), quarried near Santa Ana, Calif. In order that the huge blocks might be placed without danger of marring, they were first centered and rested on blocks of ice, the gradual melting of which permitted their being lowered into precise position.

Near the figures, and elevated above the floor, is a compass, framed by the signs of the zodiac.

Surrounding the base, upon which rest the figures, is a terrazzo floor. Inlaid in the terrazzo is a star chart, or celestial map, designed to preserve for future generations the date on which President Franklin D. Roosevelt dedicated the dam. The dedication occurred on September 30, 1935, and at 8:56 that evening the flagpole pointed exactly at the center of our sun; i.e., the center of the ecliptic. The position of the stars shown in the floor is related in hour, minute, and right ascension to this center. Thus our pole star (Polaris), indicating the true obliquity of the North Pole of the earth, is shown to a split second as of that date and hour.

Also marked on the star chart are momentous historical periods. Marked in the terrazzo is the position of a pyramid (2700 B.C.) when Thuban (Alpha Draconis) was the pole star of the ancient Egyptians—the Biblical Star of Egypt. The incarnation of our Lord, marking the beginning of the Christian era, is indicated midway between the location of Thuban and Polaris. By walking to the rear of the base, upon which rest the figures, one can locate Vega, the pole star yet to be, thousands of years in the future.

The apparent magnitudes of the stars are shown on this chart as they would appear to the naked eye if but a distance of 10 parsecs from our Earth. It requires 3¼ sidereal years to travel a distance of one parsec at a rate of 186,300 miles per second. In other words, one parsec represents roughly 19 trillion miles. The actual distance to most of the stars is more than 50 parsecs.

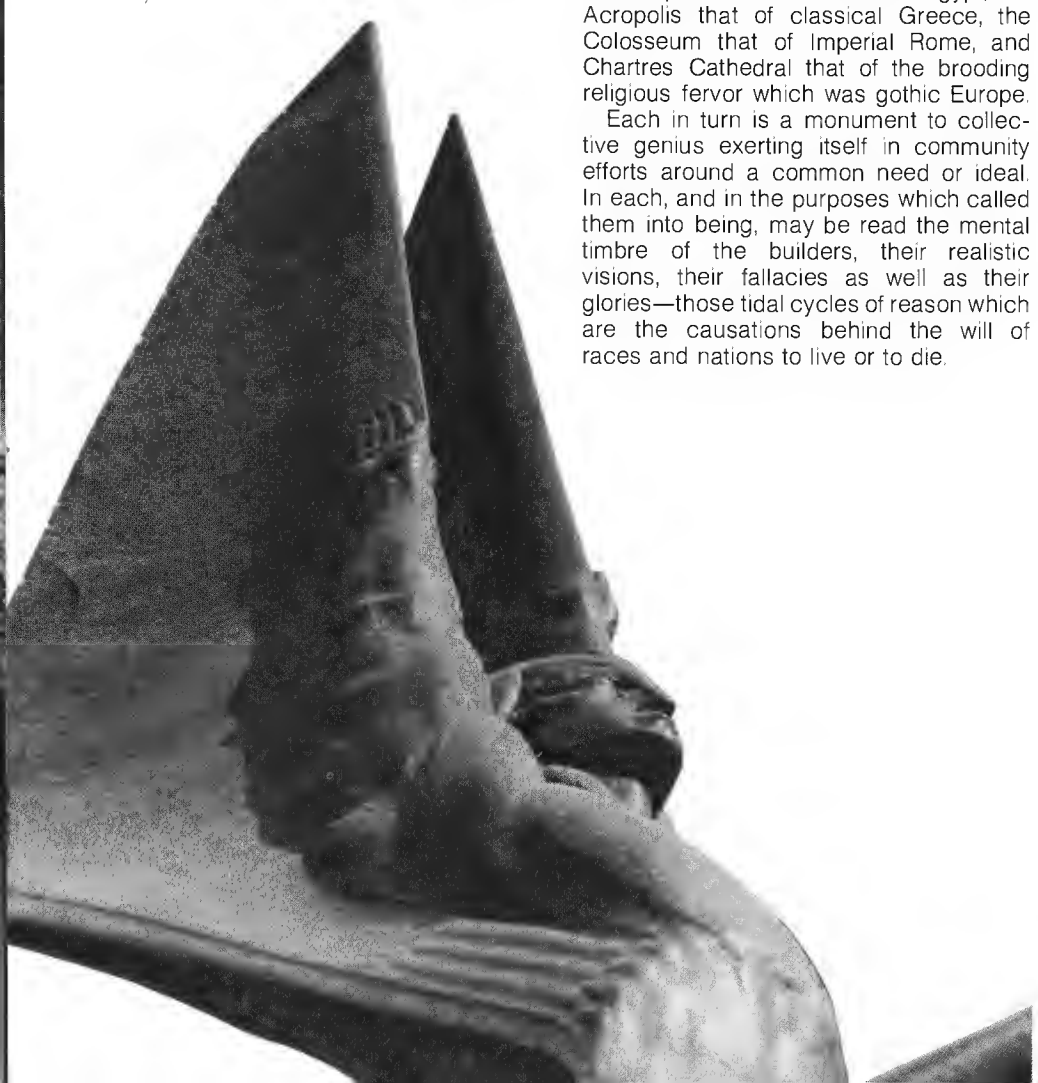
The designer of the star chart, following the calculations of the Naval Observatory, the Smithsonian Astrophysical Laboratory, and other authorities, placed the bodies of our solar system in the terrazzo, correct to the minutest fraction of an inch in the scale of design. One versed in the abstruse mathematics of astronomy may calculate the precession of the Pole Star for the next 14,000 years by studying the design of the star chart. Conversely, future generations may look upon this monument and determine—if no other means are available—the exact date on which engineers and craftsmen of our generation completed this giant structure.

With the Look of Eagles

By OSKAR J.W. HANSEN, *Sculptor*

THE SCULPTURES on the Hoover Dam adorn a major structure of our times. The dam represents the building genius of America in the same sense as the Pyramids represent that of ancient Egypt, the Acropolis that of classical Greece, the Colosseum that of Imperial Rome, and Chartres Cathedral that of the brooding religious fervor which was gothic Europe.

Each in turn is a monument to collective genius exerting itself in community efforts around a common need or ideal. In each, and in the purposes which called them into being, may be read the mental timbre of the builders, their realistic visions, their fallacies as well as their glories—those tidal cycles of reason which are the causations behind the will of races and nations to live or to die.



To the final adornment and completion of these structures a sculptor was assigned. It was necessary to adorn Hoover Dam with sculptures because it is true of sculpture that it gives meaning to man's other works by interpreting man to other men in the terms of man himself. Sculpture presents a synesthesia based upon the origin, evolution, and racial architecture of the human mind and body.

A pyramid, for instance, may present a complex of awe, wonder, and bewilderment to the modern mind. Offhand, such structural prodigies may impress one as works of some race entirely alien in mind and body to our own. (I noted that the stupendous scale of Hoover Dam produces upon the average visitor a similar effect.) The public ask themselves about the builders, "What manner of men were these?"

Then, as now, the sculptor answers objectively through an art which presents the man. To us comes a smile of recognition when we note that the Pharaoh Khafre had a frame which would have sustained an all-American fullback and a face which would have insured his election as alderman in *our* first ward. We look upon the carving of this majestic gusto of 5,000 years ago and decide that this Pharaoh certainly must have been a product from the main stem of the human race.

The historic mission of sculpture is therefore to evoke a pungent realization of man and to make this realization nearly imperishable against the oblivion imposed by time. It may also shape a symbolism in human form in order to convey the very best within the reach of the aspirations and endowment of the race.

In nature the gift of all favors may not be projected into the keeping of one personality. Her wise decree ordains that physical and mental capacities should differ. On the other hand a sculptor may show in a single symbolic image the potential nobility of the race of men. The Hoover Dam is an achievement of peace, and the sculptures there could be dedicated to the finest traditions within the reach of the art.

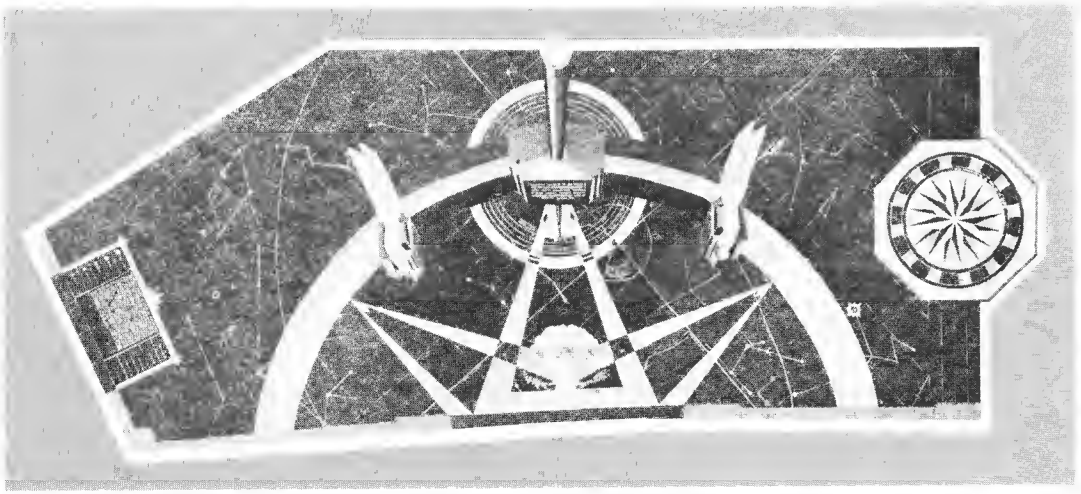
In such a place as the Hoover Dam, a monument becomes a universal as well as

Sculptor Oskar J. W. Hansen. In this article, Mr. Hansen does what an artist can rarely do: He tells with thrilling frankness how a great work came into being and what it means to its creator. He was appointed by Secretary Harold L. Ickes consulting sculptor of the Bureau of Reclamation after a national competition in search of suitable designs. His monument has been admired by millions.

a personal experience. People will not condone the reflection of their own faults in a public monument. That sculpture which draws general approval from a majority in its time therefore reflects in a peculiar sense the aspirations of that milieu.

The second stage in the appeal of a successful monument is the apprehensive curiosity it provokes. *Apprehensive,* because a human being is also a cagey animal who wants to know at once the nature of any appeal which disturbs the even trend of that *inner code* by which he lives. The votary has an immediate need to know how a monument is able to reach into his *own* emotions.

This is legitimate curiosity. It results in such questions as "How do you begin?" and "How do you do it?" How it is done, I shall attempt to explain later.



The best I can do in telling how I begin for my layman inquirer is to give him an *inkling* as to why *a monument is a monument*. So I will endeavor to tell why the sculptures on Hoover Dam are seated and not standing, why their hands are up and not down, so to speak. I will try to tell you some of the thoughts you would find being weighed in my mind if you *could* come upon it directing my hands in their work.

You would then become aware that the sculptures on Hoover Dam result from my concise application of the knowledge that *the true nature of a substance determines its balance*. I use the word *balance* to convey an image of the characteristic gravitational relationship of a physical body, or of a person, to this universe of which we are a part. Of those human beings with exceptional mental and physical endowments, it is said that they are *finely balanced*. This is a literal as well as a figurative statement.

I hold the balance of a *person* to be established as the *law of his being* at the moment of conception. Not only is he then endowed with the hereditary attributes of species and race; but the *order* of his own individual life pattern is established as an *entity separate* from that of other beings. There is established a *unique magnetic field*. This magnetic field is the fulcrum against which the physical body is levitated into existence. It remains a constant so long as the *person* lives.

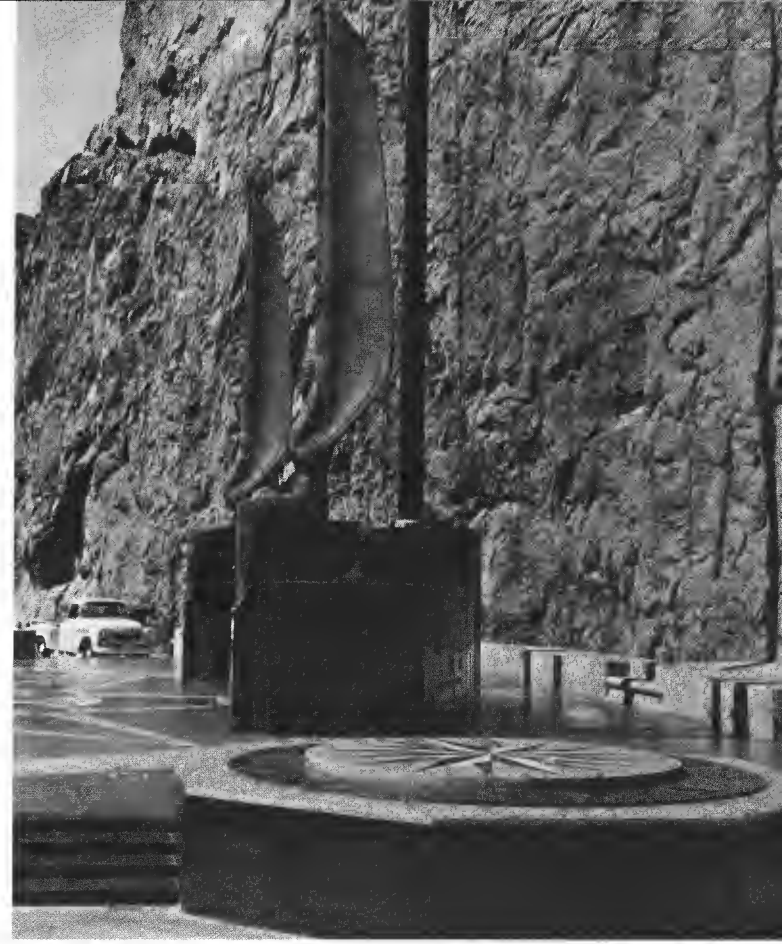
In conformity with the rhythm of a person's magnetic field his body cells live, grow, differentiate, and assemble to become the dimensional implements of his soul. In the flow of this rhythm move the creative impulses of *thought*.

When the memory of this magnetic pattern, or *balance*, is lost, the soul may no longer maintain direction and control over the component cells within the physical body. Some of these cells then divert their activities into *evolutionary directions unrelated to the person* of whom they are a physical part. Some may differentiate at random while other units cease to function. It is said of such a person that "he can no longer call his soul his own." It would be more correct to say that he can no longer call his body his own. A body loses *balance* and dies when it becomes progressively unrelated in its parts to the controls of that magnetic field established as the beginning of a *person*.

This is the "stuff" on which a person's dreams of life are made. Inversely, it may be the "stuff" on which the dreams of universes are made.

The *act* of living is therefore a *strife* to retain *balance*. A person strives thus during the entire waking state of his life. Some intensify their sense of *balance* in the steps of the ballet, some do the same with music and song, while others find it in activities of the mind while the seated posture of contemplation permits the body to follow the revolving Earth. A clown evokes our mirth and also our pity because he assumes balances exactly contrary to the true postures of the emotions he purports to convey. One thing in life is certain and that is, whichever occupation a person enjoys the most, it is bound to be one of those which coincide the closest with his *personal need* for keeping in *balance*.

Mental and physical fatigue causes temporary or progressive loss of control over the organisms of the body. After a certain number of hours a person must rest



The winged figures of the Republic.

The compass at the left of the monument makes a pleasing pattern viewed from above. Arranged about it are the 12 signs of the Zodiac.

Details of three of the plaques around the compass.

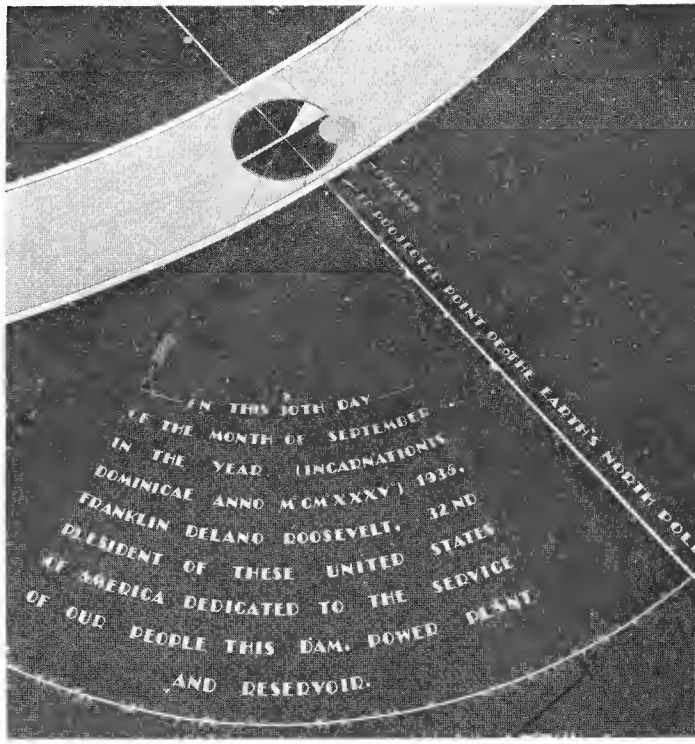
in freedom from this strife. Sleep, and in a larger sense death, perhaps, are the mechanics through which nature recharges the human battery.

There is *no fixed point of rest* from which a sculptor may project a figure in human likeness. He may not model the two feet on the ground and then evolve on top of these a figure either psychologically or structurally true to nature. His creation, like a human babe, must be first conceived in the mind as a personality. It must then be given structural attributes to implement that personality. The gravitational center of the mobile sphere of a cranium is therefore the *critical point* from whence a sculptor must begin. He then proceeds to plot the exact relationship of this *mobile* center to the gravitational center of Mother Earth.

Since man thus encases the core of *his being* within the thermos bottle of his cranium, it follows that all other members and organs of the human body are organized as specialized equipment ordained to move, defend, feed, reproduce, and maintain in gravitational *balance* the *being* who dwells *in space* within his cranium. It is then readily seen that the members and masses of the human body *must arrange* themselves around a *mean* line drawn from the gravitational center of the Earth to the center of that planetary mass which is a man's head.

You would find me continuing the projection of my sculptured figures on Hoover Dam by transposing my mental picture of a man's cranium and thinking about it in turn as though it were a heavy vessel filled with liquid which someone is trying to balance on top of a long pole. In my mind I would make the observation that the vessel is very full and must be balanced neatly; or that, if it happened instead to be mostly empty, it could be carried at many a rakish angle. I would remember that Mother Nature carries those craniums which contain finely attuned thinking mechanisms in erect bodies with an unfaltering and confident stride. To others she may grant just sufficient balance to keep for them a precarious hold on life.

My thought would then record that there was a point in exact prolongation of the



Portion of terrazzo star map shows position in the equinox towards which the pole of the Earth's equator pointed on September 30, 1935.

Earth's radius where the vessel could be maintained in balance with a *minimum effort* and that away from this vertical there came an *acute angle* where it slid off the end of the pole. My practical conclusions would again transpose this picture for application to my human problem and it would be plain that, in between the perfect vertical alinement of a person and that acute angle where sensibility ends lie the *posture indexes of all human emotions.*

These postures may be matched to their corresponding reflexes in terms of angle and degree much as one would join cams in a worm-gear drive. There is an angle for doubt, for sorrow, for hate, for joy, for contemplation, and for devotion. There are as many others as there are fleeting emotions within the brain of each individual who inhabits the Earth. Who knows not all these postures of the mind if he would but stop to think of them as usable factors for determining proclivities of character? It is a knowledge bred down to us through the past experience of the whole race of men.

Ordinarily these posture indexes of character are referred to as *expressions.* By adopting this common term we may say, then, that expressions are the bodily reflexes of mental efforts to keep in balance. Then mental efforts may be observed in terms of subtle inclinations of the head or of the whole body, in gestures of the hands, by the pointing of a finger, by the certainty or uncertainty of the stride, or they may be indicated through a mere fluttering of an eyelid as it veils with momentary secrecy the inner turmoil of a soul.

In practice, you would find me referring to posture angles as a writer would refer to the lexicon and dictionary, or an engineer to his tables and slide rule. I select for my figure in sculpture those angles which express the predominant emotions and characteristics of the per-

sonality I wish to evoke from the bronze or stone. In other words, I remember that through these postures and flexions of the bodily structure we transmitted thoughts of joy, menace, or fear long before men had the faculty of speech. I remember, while the spoken word may not state the truth, "actions speak louder than words"; and that postures may not for long be maintained contrary to the elementary *Truth* in a man. Any sculptor worth his salt should know that the expressions of a human body close around the core of a person's inner balance like a finely tailored garment.

If you then continue to follow my construction of the Winged Figures of the Republic on Hoover Dam, you would naturally expect me to concentrate first on the characteristics of the heads. There grew up with the settling of this continent a virile type of man, inured through constant adjustments into quickness of wit and beaten by privations and the strong winds of mountain and plain into a facial physiognomy with the look of eagles. It is the American type.

The craniums of the American type are finely shaped, high and domelike of forehead, lean of cheeks, and potentially sparse of words. If the eyes are said to be "the windows of the soul" then the eyes of the American type in their clear, piercing glance show the mental fire, daring, and imagination which crackle like burning coals within. Such heads contain a largeness of spirit, a willingness to assume risks for an ideal, ever lacking in a generation of shopkeepers.

The building of Hoover Dam belongs to the sagas of the daring. The winged bronzes which guard the flag therefore wear the look of eagles. To them was also given the vital upward thrust of an aspirational gesture; to symbolize the readiness for defense of our institutions and the keeping of our spiritual eagles ever ready to be on the wing.

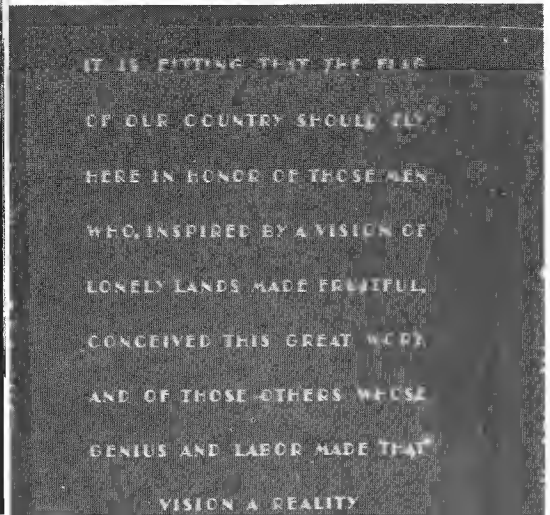
The building of Hoover Dam was a venture into the humanities. It was therefore not necessary to clothe these bronzes in any of the apparel, disguises, or trappings which the weak are prone to wear in order to seem great. I made these figures nude, but modeled them so they would not seem *naked*. It was my idea that my spectators should find them mighty of body and clean of soul; armed only in the winged imagination of their own thoughts.

Then I dared to erect two of these figures identically alike. I wanted to emphasize the common origin of our humanity which under our institutions is expressed in a Bill of Rights that is a law alike for rulers and for peoples. In the jealous guardianship of the sacred entity of individuals lie the potent powers of those who govern. In their common good will lies the security of the flag.

I said once before that a seated figure follows the rotating earth. The seated figure *maintains balance* by pivoting the upper body on the lower end of the spinal column and thus making the limbs available for angular braces against excessive body movements. The seated person may thus put *less effort* on keeping in *balance* and has *greater energy* for *external thought*. We seat a judge, or a presiding officer; we enthrone a king.

The Winged Figures of the Republic give evidence to the thought which preceded the reality of Hoover Dam and to that eternal vigilance which is the price of liberty.

Flagpole base inscription recognizes those who envisioned and built Hoover Dam.



INSCRIPTION ON THE STAR MAP

IMPORTANT STARS and features of the Polar region of the sky as it appeared at 21:30 local apparent time on 30 September 1935, when this structure was dedicated, are shown by the diagram on this floor.

The apparent magnitudes of the stars are measures of their relative brightness as estimated directly by the eye. By comparing the apparent magnitudes and considering the known distances to the stars, determinations have been made of the absolute magnitudes or the brightness the stars would display if they were a distance of 10 parsecs from the Earth.

The distances to the nearest heavenly bodies are measured by triangulation. A distance between two points on the Earth is used as a base line and very exact distances are then determined by measuring angles to such nearby objects as the Moon, Eros, and other asteroids. This provides a scale for measuring distances within our Solar system. It shows the mean distance to the Sun to be 92,900,000 miles. This is taken as the unit of measurement within the Solar system. Twice this value, the mean diameter of the Earth's orbit about the Sun, is a new base line which permits direct measurements, subject to diminishing accuracy as the distances increase, to be made to stars within 50 parsecs. When the angle at a star subtended by the mean semidiameter of the Earth's orbit is one second of arc the star is one parsec distant.

The sidereal year is now 365.256360 mean Solar days; 3.258 sidereal years are required for light to travel one parsec at the rate of 186,300 miles per second. Our Sun has an absolute magnitude of +4.9; the most luminous star, S. Doradus, a value of -8.9 (320,000 times as bright as our Sun); and the least luminous star, Wolf, 359, a value of +16.5 (1/50,000 the brightness of our Sun).

The distances to the vast majority of the stars are beyond 50 parsecs and must be measured indirectly. By a careful spectroscopic study of the intensity and spectrum pattern of the star's light, its approximate absolute magnitude can be determined. When this absolute magnitude is compared with the apparent magnitude, the distance to a star as faint as the twelfth apparent magnitude may be determined. Spectroscopic study of a star's light discloses also the temperature of the star, its total radiation when its distance is known, and permits the determination of its linear diameter. By analyzing the dynamics of double star systems or binaries, the masses of certain types of stars may be determined, and a study of the problem of the interior conditions of the stars can be undertaken.

The known relation between the period of variation and the absolute magnitude of Cepheid Variables furnishes another method for more distant measurements. Stars like these have been studied in galaxies far beyond our own Galaxy or Milky Way.

The prism and grating of the spectroscope separates light into its component colors and the light patterns in the spectrum tell the physical and chemical nature of the light source. If these patterns are shifted toward the blue, the light source is approaching. If the shift is toward the red, the light source is receding. Thus the radial velocities of stellar bodies within our system may be determined. By considering these radial velocities and the relative cross motion of faint stars, it has been determined that the center of our Galaxy, or Milky Way, is roughly 10,000 parsecs distant, and the time required for the Sun to complete a circuit around this center is in the order of 200,000,000 years.

This dam is a major structure of our times. That astronomical date line of the day of its dedication, imparted to future times by this monument and star diagram, is established in consequence of these theories, facts, and conclusions.

When, in the course of time, the composition of our world and those other worlds in space shall be more fully known, record it here for future men to see . . . and, having seen, to speculate, investigate, and carry on the search.

A Split Second Petrified on the Face of the Universal Clock

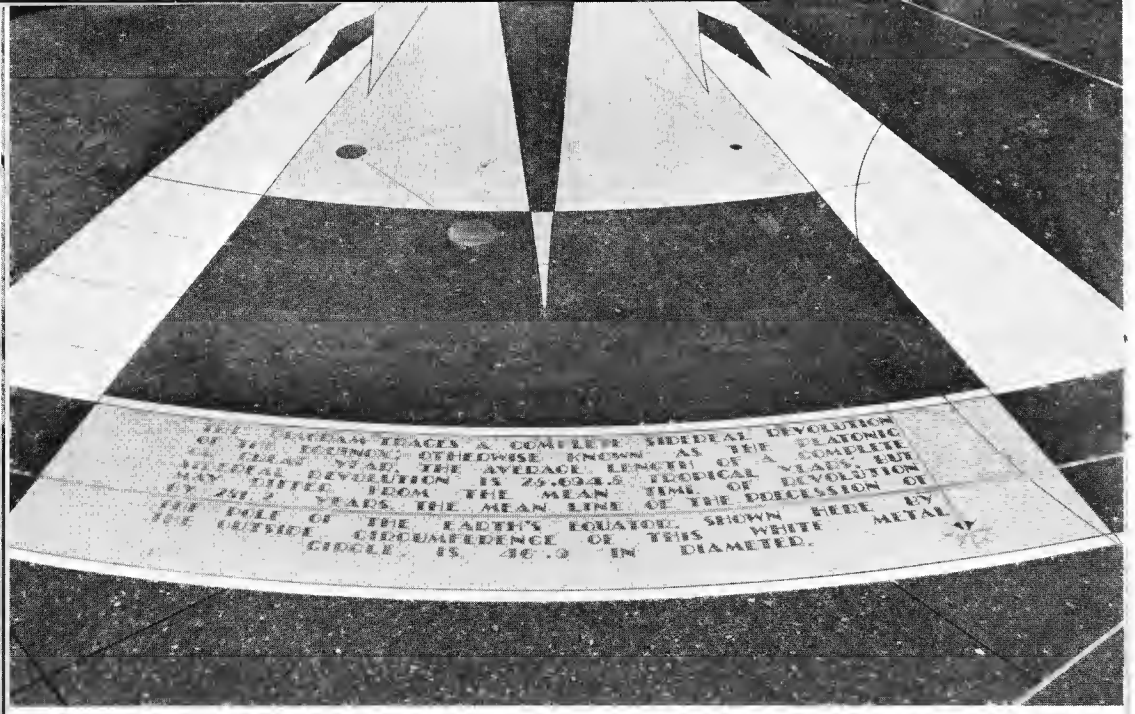
Mr. Oskar J.W. Hansen, the sculptor, said in his report on his work with respect to the terrazzo star map and precessional diagram which forms the base plane of the monument at Hoover Dam:

"I have been told that perhaps the public at large seek more concrete explanation, are lacking in understanding of the intangible values of life and that it may be better to speak to them in terms of tons of concrete and tons of bronze. If I had held the latter notion, it would have been dispelled by questions asked me by the public while I worked on this monument at the dam. I know from them that their wish to understand is great, their capacities unlimited.

"Man's control over natural forces has grown in proportion to his increasing knowledge of the true nature of this Universe of which we are a part. The external search with the telescope has immeasurably hastened our internal search with the microscope. Time, the intangible governor of all our acts, is measured to us by the external relations of our Earth to other worlds in space. Therefore, I thought it fitting to have the base of the monument rise from a finely wrought, marble terrazzo star map of the northern regions of the sky."

DAY BY DAY, and in remote ages to come, intelligent people may view the star map out of which rises the monument at Hoover Dam and from it learn that the astronomical time of the dam's dedication was in the year 1935 of Our Era, on September 30, and at 8:56, 2.25 seconds in the evening of that day, as calculated from the center of our Sun, or the center of the Ecliptic.

On this star map, the center of our Sun is shown as the very center of the flagpole. The positions of the stars shown on the map are then related in hour, minute, and right ascension from this center of the Ecliptic. The true obliquity of the North Pole of the Earth's Equator is shown in the same manner as of that split second of time mentioned in the previous paragraph. All information, relative to astronomical theories and facts, has been verified by the Naval Observatory, the Smithsonian Astrophysical Laboratory and by other reliable sources. People ordinarily indicate a star with a five-pointed symbol. Under a sufficiently



Inscription and detail of star map in terrazzo floor in front of monument.

powerful telescope each heavenly body would show a disk like that of our Sun or Moon. The star map on Hoover Dam shows a firmament of such brilliant disks. These Nickel-Silver disks are scaled to the exact diameter for the relative Apparent Magnitude of each star.

A legend has arisen to the effect that only five people understand the information given on this star map. While the number is not so *limited*, it is true that this map shows astronomical evidence which results from very obtuse mathematical calculations. It is not necessary that the average visitor should be able to solve, along with top-flight astronomers, their most difficult problems. Not one educated person in a thousand may know how to calculate true time or to navigate a ship; but almost everyone can read time from the dial of a watch. The precessional diagram which traces a *Platonic Year* about the center of our flagpole is in many ways similar to a watch dial. Let me first remind you how the Sun's family of planets are arranged about her in space.

Could we trolley home on Halley's Comet from some distant point of the Milky Way Galaxy, we would find our Sun's family appear very much like the familiar picture we know so well of Saturn and his rings. In the case of the solar system, the bright bands we could see extending out into space from the Sun's Equator, or in the main, along this Ecliptic Plane, would be made up from the Asteroids and other star dust debris. Our Earth would be seen to shine like a blue star sapphire while it passed in and out among these nebulous rings of solar star sweepings. The other planets would appear like faintly tinted diamonds of varying hue, as they followed the Sun within her sparkling diadem in space. Try to visualize this picture as I explain for you the nature of the celestial watch dial which is fitted around the flagpole base on Hoover Dam.

Instead of measuring 12 earthly hours this dial measures a *Platonic Year*. A *Platonic Year*, or *Great Year*, according to Stockwell, is made up of 25,694.8 of our ordinary years. We cannot be too sure

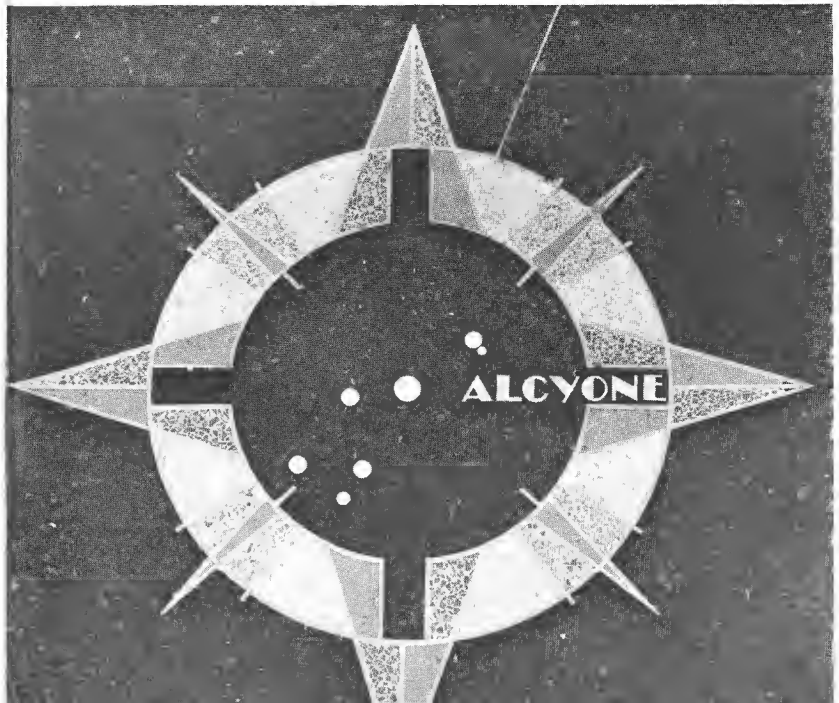
of the exact length of the *Platonic Year*, because the civilized history of man, and hence astronomy, is at the most only 10,000 years old; but we feel certain that it may not vary from the above mean time by more than 281.2 of our ordinary years. After a few thousand years, the people who come to see our huge watch dial on Hoover Dam will be able to tell by referring to our calculations whether we have set our celestial watch to run a split second too fast or too slowly.

We know that they will find our huge watch is *running down*. The nemesis of the Earth is her silvery Moon. The Moon causes our tides to rise as her gravitational pull acts, in unison with that of the Sun and her other planets, upon the equatorial masses of the swiftly rotating Earth. Since the Moon moves continually either up above or below the plane of the Ecliptic, her braking action on the Earth is very uneven and disconcerting. It causes the Earth to wobble as she spins on her axis. She nods approximately 2,800 times to and from the Sun during a *Platonic Year*. This tidal friction and consequent nodding causes her to lose time at the rate of almost 2 seconds per century.

At the end of a *Platonic Year*, our day would be longer by 8 minutes, more or less. This is not a lot of time, and you and I may not be here to count it, but it interests ,us just the same. It affects progressively the mean temperature on this Earth. The mean temperature controls precipitation and precipitation is of interest to the Bureau of Reclamation and the world in general.

Finally, the day will get so long that it equals our year. The Moon will then again be a part of our Earth; mutual attraction will have made them one. The Earth will then present but one glowing face to the Sun; while on her other side darkness will be forever "upon the face of the deep."

If man could adapt himself for life under such conditions, he would be found in the zone of eternal twilight which will rim the Earth in between these temperature extremes. It is not likely that he will be present, though. The quantity of oxygen will be negligible, if not non-



Star map in terrazzo floor includes many details such as those above and on preceding page.

existent. Our atmosphere will have dissolved and with it all green and living things familiar to us. The Earth will move, a barren hulk in space and her face will be pitted from continuous collisions with meteoric debris. We need not worry about this coming event but its eventual progress may interest even us. Our watch dial and observations to be made in the future and then referred back to the needle point, which we show at the intersection of the Meridians, would show our visitors from century to century if our watch is *running down at the same uniformly slow rate*. They would simply observe if the North Pole of the Earth's Equator continues to nod to and fro within the limits of the yellow band around our flagpole.

I made the Diorite base of the monument describe an arc through the central field of this celestial watch dial. The whole composition is faced toward the arc of the dam and is arranged so the portion of the *Platonic Year which records the early dawn and continued human history* comes directly in the front and center of the monument.

In reality, there is shown both the end and the beginning of a *Platonic Year*. The Meridians, which serve as watch hands on our dial, intersected where the image of a Pyramid is shown in that, to us, ancient day when Thuban, the Biblical *Star of Egypt*, gave the direction, North, to the children of Israel by the fleshpots of Egypt. Centuries later, the Egyptian priests were to show to Herodotus the coming signs of a *Platonic New Year*.

This prediction was fulfilled in the year 0 of Our Era, when Christ was Incarnated and the Sun passed the Meridian of her Zodiac at 11 degrees West of Greenwich and the Aquarian Age of Man began. Further on is found the black circle with a white wedge which indicates the diurnal rotation of the Earth on the day of the Dam's dedication. By comparing the segments which these events cut from the whole circle of the *Platonic Year*, we note that history is brief and that humanity is treading with uncertain, emotional steps the paths of youth in springtime.

Let me mention a few other interesting features of this star map, such as: Andromeda, Nebular Universe closest to our own Galaxy, the North Pole and Equator of our Milky Way Universe, a compass which indicates the North of the Earth's Magnetic Field, the bronze bas-reliefs which depict the ancient Signs of the Zodiac, the Apex of the Sun's way in space and an inscription which gives a brief of the methods man follows in his search within the incredible distances of space and some of the results he gleans by that search. The end of this brief is a plea to future peoples to carry on and build for future minds, knowledge concerning the true nature of our own and of those other worlds in space.

From Bones of Water Pipe and Wood

LEGITIMATE CURIOSITY accounts for the ever present desire to come upon the sculptor while he works. When confronted by the results of such work the word "beautiful" seems to be the inclusive word by which the public express approval of an object which they like. I saw "beautiful" form a half million times on the lips of people who came to see my works on Hoover Dam. Each of them did light, in the words of Shakespeare, "the faggots" they had "brought." It is therefore a pleasure to implement their understanding by answering the questions asked me most frequently by the public while out on the Dam. It was, "How do you begin?"

Since the subject of the sculptures on Hoover Dam is man, a true answer to the above question would be that one begins where man began: "In the beginning." It would be a declaration fully as direct as when the poet says, "We are such stuff as dreams are made on." "What then," I hear you ask, "on what stuff are dreams made?"

So I sought a more homely simile when I answered this inquiry once by a return question. "Madame," I said, "when you peel an orange, do you begin by sticking the end of your thumb into its center?"

Mine was not a facetious reply. I implied that in a creative sculptor the vision of the whole in the terms of its parts had to be so keen that he may with safety remove from a block of marble that part of the stone which he does not need. What remains is the immortal residue. Inversely, there is no fixed point of rest from which a sculptor's image may be projected into form. Creation is a simple and direct act which has its basis in knowledge. If, like The Lord in Genesis, one knew the true nature of Light, one could say also quite directly, "Let there be Light."

In other words, the sculptor has to know, figuratively, that his orange has a peel, that inside this peel lie a series of segments within the pulp of which are contained both the juice and the seeds. If he has such foreknowledge, he may work on his orange so as to obtain either the juice or the seeds, or both.

It follows that peeling an orange does not constitute the whole knowledge concerning this fruit. One does not thereby come to know how it grew or the other series of facts which would be essential to the knowledge of a botanist. However, a person wishing to enjoy an orange could say much in the manner of Gertrude Stein that, *an orange is an orange*. It is neither vapid nor uninteresting, therefore, to discuss the mechanics of monument making.

The inception and the basic ideas inherent in the Winged Figures of the Republic were given in a previous section.

The technical side of their making, from bones made from water pipe and wood, the final model, the sand molds weighing 492 tons with 18-inch I-beams to hold the pressure of molten metal, the sand cores, the baking and the final tense moment when more than 4 tons of statuary bronze,

Memorial set into rock canyon wall on Arizona side of Hoover Dam pays this tribute to labor: THEY DIED TO MAKE THE DESERT BLOOM. THE UNITED STATES OF AMERICA WILL CONTINUE TO REMEMBER THAT MANY WHO TOILED HERE FOUND THEIR FINAL REST WHILE ENGAGED IN THE BUILDING OF THIS DAM. THE UNITED STATES OF AMERICA WILL CONTINUE TO REMEMBER THE SERVICES OF ALL WHO LABORED TO CLOTHE WITH SUBSTANCE THE PLANS OF THOSE WHO FIRST VISIONED THE BUILDING OF THIS DAM.

Inscription on Arizona elevator tower says: SINCE PRIMORDIAL TIMES AMERICAN INDIAN TRIBES AND NATIONS LIFTED THEIR HANDS TO THE GREAT SPIRIT FROM THESE RANGES AND PLAINS. WE NOW WITH THEM IN PEACE BUILDETH AGAIN A NATION.

heated to 2,500° F., was poured in a molten stream to form their continuous shells just five-eighths of an inch thick and 30 feet high from toes to wing tips, is a saga of its own inviting parallel in the history of sculptural art.

All these operations were precarious, some were unprecedented, and as a result of any of these mechanical cocoons through which these figures passed their "bones" could have "withered," so to speak, and their "hopes" been "lost." That they now spread their shining wings over Hoover Dam is a credit to many willing hands whose patience and skill assisted the sculptor in these processes which were sometimes menial. Of these artisans a demand was made for far more than manual skill. They had to visualize vicariously the final purpose of the sculptor, so that the birthright of these figures would not be lost inadvertently.

There were many collateral reasons for permitting the figures to be composed as they are now. The flagpole, the vertical cliff behind the plaza, the rise of the dam out of the Gorge of the Colorado, the flag itself, up in the blue; all of these made a vertical composition mandatory. The distant view of the Fortification Mountain and the closer mesas made it desirable to break this vertical composition with the single angular bend of the seated posture. The shape and surface areas of the wings were not only calculated to convey a potency for flight but to repeat the shadow wedge areas created by the serried buttresses along the face of the dam, but in the inverse order.

The patterns on the pavement are crystalline in line and spread out horizontally toward the Diorite base from whence the figures reach their wings up toward the flag. The objects on the polished floor are reflected into the planes and curves of this Diorite base. This igneous rock lent itself admirably to this purpose. It is hard, even of texture and received a wonderful polish. The volutes and facets on this stone were carefully designed to reflect the light of the sun in bright diagonal shadow patterns upon the polished terrazzo.

The Diorite deserves a special mention. This stone has for ages been a favorite with sculptors and was used with telling

effect by the masters of the Golden Age in Egypt. It remained for our country, from near Santa Ana, Calif., to produce the finest known variety of this stone. I may say in passing that these huge blocks, so highly polished, could not be placed by ordinary methods. They were lifted onto blocks of ice and guided into their closely fitted places as the ice melted from under them. When the base was thus in place the bronze-bearing steel flagpole was dropped through a hole in the central block, down into a prepared socket deep in the mountain. The golden ball mounts 142 feet above the star-map.

The figures were spaced a correct distance apart so that from whatever angle they should be viewed, their wings would point in unison upward along the two sides of a triangle at the apex of which the flag flies. I must again mention the use of polished surfaces and reflections. I could not compete with the majesty of the mountains as to size, nor with the arc of the dam, itself, for majestic sweep of line. I chose to make this monument, in spite of its great size, very much in the nature of a jewel with many sparkling facets to reflect the wider horizons of man's being and of man's world. It was my hope that those who step from the roadway of everyday life onto the polished pavement among the stars of the star-map about the base of the monument may feel the exhilaration of a journey far flung in intent and native to the dynamic and adventurous spirit of America.

On the Arizona side of the dam, the mountain holds a memorial placed by the United States in enduring bronze for those who toiled and died. On this bronze is carried also an appreciation of those workmen who carried the structure to completion. Here the United States sets the precedent of commemorating the abiding dignity of those who labor.

On one elevator tower, a series of five bas-reliefs in concrete show the purposes served by Reclamation projects; and on the other, the visages of those Indian tribes who have inhabited those mountains and plains from ages distant. From the appeal of freedom which existed in the

Inscription on Nevada elevator tower cites these multipurpose Reclamation benefits of Hoover Dam: FLOOD CONTROL—NAVIGATION—IRRIGATION—WATER STORAGE—POWER.

breast of the Red Man as he reaches his hands toward his *Great Spirit* above to the joint effort for the building of a common destiny depicted in the act of peace on the lower panel, these reliefs express in visible symbolism the abiding values of our Nation.

This report does deal, in the way that sculpture itself must deal, with many intangible values. If this were not so then men would not commemorate their existence in such monuments. The problems which the sculptor must face and with which he must deal in his art are the problems analogous to the infinite paradox of life, itself.

It has come to me with deep conviction through the building of this monument as a setting for our flag that an inherent respect for the individual is the keystone of the American mode of life. Out of these pages shines the belief that to draw the breath of life is in itself a stupendous wonder; an achievement precious to the knowledge and care of the Creator. It is with this conviction that we of the Americas must face the future; with tolerance for the entity of the individual regardless of His gifts.

Greater far than Hoover Dam is the object lesson it teaches in the humanities. Through tolerance, the unquenchable spirit of America will aspire, like the Winged Figures of the Republic on Hoover Dam, ever upward to keep our flag in the blue.

As the Nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering the wisest use of our land and water resources, protecting our fish and wildlife, preserving the environmental and cultural values of our national parks and historical places, and providing for the enjoyment of life through outdoor recreation. The Department assesses our energy and mineral resources and works to assure that their development is in the best interests of all our people. The Department also has a major responsibility for American Indian reservation communities and for people who live in Island Territories under U.S. administration.

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