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TOWER OF THE CHURCH OF SANTIAGO, TOLEDO

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A BELGIAN OBSERVATION TOWER

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An Architect Abroad With Hoover's Legion

By LIEUTENANT ALFRED P. SHAW

Illustrated with Sketches by the Author

AS far as I can make out from the recollection of what friends returning from Europe and the natives tell me, the Dalmatian Coast has hardly been the mecca, either of architectural students or tourists from America, and though the interest is sometimes pretty well scattered there is a great deal to be seen here, especially during the spring and summer months when the sun and the old Adriatic combine to brighten things up. It has been my fortune to be sent here as a representative of the Interallied Food Commission and architecturally, as in many other ways, there have been many surprises. The cities of Trieste and Fiume, although larger and busier, do not possess the proportionate or even the actual amount of architectural monuments that do most of their outclassed commercial rivals far to the south such as Zara, Pola, Spalato and Ragusa, where, in most cases, either the ex-Austrian Government or private interest has taken means to preserve them.

THE HARBOR AT SPALATO, DALMATIA

Besides the larger places there is hardly a town of any size, either on the coast or the islands, where one cannot find a record of the former architectural richness of the country, even though in some cases it is only the delicately carved and well preserved shield of some Italian family over the door of their former palace. In most cases these bits of interest date from the days when the merchants and governors of the Venetian republic, which then included Dalmatia, were engaged in the work which proves to us that "Venice spent what Venice earned," but in Spalato and Pola, for example, those monuments of the Roman era are the more important. At the former of these towns Roman columns, sarcophage and the rest are often dumped carelessly along the side of the street with other stones and peasants build their houses with whatever they pick up, whether it be a part of a tomb, a nearly cut rock or a fragment of an inscription written to the everlasting memory of one of Diocletian's tennis partners. For here to Spalato during the first years of the fourth century were sent from far and near the architects of Rome itself, expert workmen, and all manner of costly materials to construct by his will and for his pleasure an imperial palace which would be worthy of being his home during his declining years for the greatest man of his day, the emperior of Rome. And it must indeed have been worthy of the grandeur of its builder.

The best restoration of the plan which I have seen is that made by Robert Adam, whose name we all bow to, in the eighteenth century. It is a great rectangle, 570 feet by 700 feet, and after the fashion of ancient Roman camps has a square tower at each corner. From the top of the medieval tower, now erected in the middle, the exterior walls can be easily traced and some idea of its size can be obtained from the fact that over three thousand people

now live within the walls of the former palace. It is not strange that Diocletian should pass the last nine years of his life here about ten miles from Kucine, where he was born and where his father had been a slave, for there was surely that longing to revisit the scenes of his birth and the sterile,

THE MOUTH OF THE CETINA AT ALMISSA - DALMATIA

rugged beauty of this coast must have been inviting from the pomp and splendor of Imperial Rome, especially to one born here.

The most interesting building in Spalato is the Duomo, formerly the Temple of Jupiter—although some historians have claimed that it was built by the emperor as his burial place. It occupies the most important point on the plan and is "after the Pantheon in Rome the best preserved and most interesting example of a Roman temple in existence." It is now used as a church and contains fine work of later days, especially remarkable being the peculiar choir stalls carved in wood and the panelled wooden doors. Dating from the original scheme is also the Temple of Esculapius, now the Baptistry, a smaller rectangular building, roofed with a beautiful coffered barrel vault, spanned by three voussoirs, and the several gates, the Porta, Aurea, Porta Argenta, and Porta Ferea.

Of Venetian work, Spalato also has her share; there are palazzi within the walls of Diocletian's larger one, great forts from the walls of which stand out on corbels the sturdy lion and up every alley we can find the welcome delicacies of that graceful style, doorways, balconies, intricately carved family arms in their frames of Venetian dentils, or perhaps looking through an unpretending hole in the wall and behold a somewhat dirty but nevertheless real Venetian courtyard.

At the former Roman town of Salona, just outside Spalato, there still remain the ruins of an early Christian Basilica, the Basilica Urbana, a fine old amphitheatre in the arena of which now grows the peasants' produce, cemeteries, Christian and pagan, with their valuable sarcophaghi and, of course, the many fragments of walls and entrances by which the plan of the city has been traced. From A. D.

CLOISTERS IN THE MONASTERY OF SAN FRANCESCO - RAGUSA

305 to 315, while the palace on the sea at Spalato was being built, Diocletian lived here at Salena and there sprung up around him an elegant pleasure-seeking life and people. The character of the remnants of this age shows the richness of their life

and when some time later the Avars came down from the North the people of Salona once honored by a Caesar for their bravery, did not possess the steadfastness for a successful resistance and fled before the barbarians to refuge in the more strongly protected palace of the former Emperor; and then began the history of Spalato as a town. Unfortunately the work of the Avars was done with a thoroughness and a cruelty which reminds one of a present day boche occupation and although I searched I did not find a sarcophagus which had not been broken into. The excavations have comparatively only begun and it is hoped that the work started by the former Austrian Government and so admirably conducted by Professor Bulis will find another and even more enthusiastic patron. There is the new museum built at Spalato, now being used by the American Navy as a "Y" which will replace the old museum and in it will be the many and varied fragments found at Salona, from columns to coins and hair pins and including the valuable collection of inscriptions which furnish the best information as to the early history of the Colony. These relics are still being found and one of the peasants whom we employed as a stevadore offered me a whole pocket full of the coins of Caesar and Constantine for a pound of sugar.

I am sure to always recall with pleasure the cruises taken in the "Dubrovnik" an ex-Austrian Government yacht put at our disposal. It was part of my duty to visit from time to time the digerent coast and island towns to check up the prices and distribution of food as well as to help along our Children's Feeding Programs, and such duty could hardly be called painful. We would sail into these little story-book harbors, most of them very clean apparently, sterilized by the sun and the salt of the sea, the water so clear that every stone on the bottom as well as every fish in it can be seen at 35 or 40 feet. Each port has a well constructed stone dock on to which the town people, especially the children, would flock upon our arrival to get a look at the "Amerikanski." While my interpreter—who kept the only place in Sacramento where you could get real Schlitz beer and joined the Jugo-Slave legion, after incorporated in the Serbian Army—was hounding out the mayor (and if we arrived during Siesta time it was often a bit prolonged), I could walk around the town for a look at it. These little places are all very much alike, but very different from many other towns that I have seen. The houses are built of the excellent hard local stone which turns into rich ocres

and siennas with exposure and have roofs of flat stones which are painted white, evidently to better reflect the scorching rays of the sun. And then here and there would be an old Venetian palace sometimes still in use, other times in ruins, with its smoothly tooled ashlar, well designed entrances, balustrated baloncies and always the decorative family arms or the all-conquering lion of St. Mark. Some towns boast of one, others of many lions and in those which are being held by the Italians, their officers point them out with great pride, and if in the settlement of the Italian-Jugo-Slave dispute, architecture instead of politics and nationality were the deciding factor, there would be only one answer, namely "Avante Savoia." Off one tiny place called Viganj on the Sabbion cello peninsular we anchored to discharge some relief food into the boats which came alongside. There are less than forty houses in the whole settlement, but they can boast of a church which is a little gem. Late Venetian in style, and build of local stone now weathered to a rich yellow, it contains a small Rococo side altar worthy of any chapel in Italy and a once elegant cloister now in ruins.

PORTA PLOCE, RAGUSA, DALMATIA

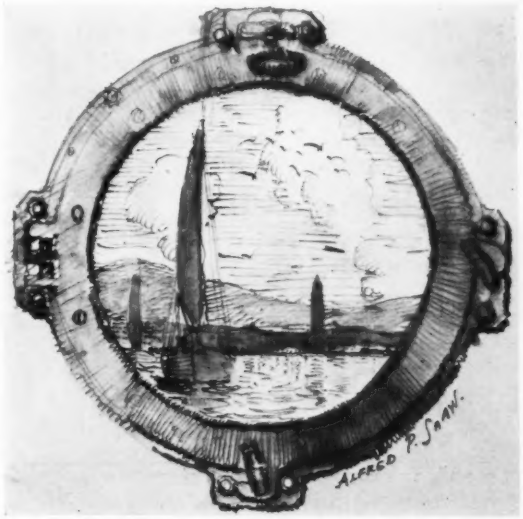
At Trau, which has come into the headlines as the scene of a landing party of our Naimes, there are any number of these little palaces, as well as a final old Duonp, which the people there claim to be the best in all of what was the Dual Monarchy and it is without doubt one of the finest. The interior with softly colored stone vaulting, delicately carved baldachino and altar and its peculiarly rich and well executed Romanesque choir stalls, where two or three stoled and surpliced fathers sat reading their office by candlelight was almost all the ask of an ecclesiasticalillumination that one could interior. Here is also a lion holding a closed book, said to be except for one other, the only such book in existence; the second being that when the proud republic fell, the book was miraculously closed. The front doorway elaborately carved in the hardest of marble represents the Old and the New Testaments and has two crudely modeled figures of Adam and Eve; for the intricacy of some of the carving, such as indication of lace and textures, it compares with the work at Chartres.

My work has taken me only once to Zara, but the visit lasted the whole day and was a real one. Col. Sherman Miles and I had come from Sebenico in the early morning on an Italian destroyer, with Admiral Galiani and Col. Vitale of the staff of the Military Governor of Northern Dalmatia and went ashore to find out that it was a fete day. The Morlacchi from the mountains inland had come to town in their most elegant costumes which are the finest I have seen in Dalmatia and the splendid colors of their richly embroidered waist coats and gaiters, elaborate silver buttons and belts along with the vegetables and fruits being sold in the market were not a shade less brilliant than Brangwyn's wildest Oriental canvases. Here as at Salona there was an important Roman settlement and one sees fragments of its architecture used chiefly in the building of later monuments. Then came the early Christian and Byzantine periods the best record of which remains in the structure of S. Donato as well as the many fragments which are now on exhibition there, for the former Byzantine church is now a museum, and the small a very precious one. Zara has more than its share of Venetian lines and in the excellent gateway designed by Sanmicheli, is especially fine. The dignified Romanesque facade of the Duomo is conceded to be the best on this coast. We left Zara late in the afternoon after a day literally crammed with architectural to say nothing of political interest and motored through barren country where every once in a while standing alone in the ridge of a hill would be seen the towers built by the natives as refuges during the days when the Turks made frequent raids into these parts.

But Dalmatia's rarest gem is old Ragusa, which will offer inspiration to an architect historian or

artist. The Regusians, who still consider themselves as a people apart, will not let you leave without knowing their history and well may they be proud of it, for the tiny republic maintained her independence from her birth in the days when Rome was Mistress of the World, until Napoleon declared that "the Republic of Ragusa had ceased to exist," and never once did the armies of the Sultan, which swept on as far as Vienna, itself enter into the town; nor did she even succumb to the wily Venetians. Her soldiers and sailors were brave men—but it goes without saying that her most effective weapon against more powerful aggressors was diplomacy.

The town is full of stories of Doges, of Sultans and of Kings. Richard, the Lion Hearted, while on his returning voyage from the Holy Land, was shipwrecked off the coast and landed on the island of Lacroma by Ragusa. There in thanksgiving for his deliverance he founded a monastery which still exists and at the same time he started Cathedral of Ragusa.



THE HARBOR AT SPALATA, DALMATIA

The architectural aspect of her former days is still quite as it was, for the restorations, if not sometimes refined, are always quaint. It is Venetian in general character, and there are great walls with many sturdy battlemented towers placed all about the town; on one side they drop down into the clear rocky Adriatic and from there climb up around the closely bunched houses along the slope on which they are built. The trolley car line stops reverently at the gate and once inside the walls you feel as if you dropped back a couple of centuries. The peasants from Bosnia and Herzegovina and Montenegro, all in their varying and colored costumes, walking around with queer baskets on their heads or carrying their goat wool bags, and standing in groups give the effect which we go after in opera settings, and the beautifully weathered buildings form the soft background to blend the whole together. The two larger monasteries, San Francesco and San Domenico, have fine cloisters, and in the patio instead of a hot pavement and perhaps a well there is a wealth of cool green shrubs and shading palms. The former is right off the Corso, which was formerly Ragusa's Grand Canal, and I have slipped in there more than once just to cool myself off, that is, into the cloisters, not into the canal. There are any number of little palaces, churches, which boast of veritable Titans, the cathedral, the Rector's Palace with a colonnade and a courtyard, which would attract attention in Venice, and—but an architectural inventory of Ragusa is a bit beyond the limit of one of Hoover's legion and I will respectfully refer you to some better source. Any architect or student of architecture who comes down through the Porta Pile, and sees on one side the Renaissance chapels, on the other, the old fountain, and ahead the corso with its orderly, sienna toned facades and does not register an unexpected feeling of admiration is not getting as good a time out of life as are most of us. I can recommend Regusa, most strongly to honeymooners or those wishing to be honeymooners. They have big yellow moons there and on those nights when it shines all the young bloods row out on the calm Adriatic and sing their sad Slav love or war songs.

The Gulf of Cattaro, according to our naval officers, is, except for Sydney, Australia, the best natural harbor in the world, and during the war it and Pola were the big Austrian naval bases. The mountains rise steeply out of the sea, giving a good depth of clear water up to the very shores and Cattaro lies in a corner of the innermost of three bays forming the Bocche; Castelnuovo, Cattaro and Porasto all have fragments from the days of the Renaissance, the best things where they seem to have been most forgotten and where now the fewest people live at, i. e., Perasto, a settlement whose early history is not very well defined.

To get to Cetinje we climbed up the side of the Lovcen, along a marvelously constructed road up, which one winds for 14 miles and is then only 1¼ miles as the crow flies (presuming that he will be

(*Continued on page 560*)

Color, Past and Present

"COLOR is one of the most potent means of human expression," says a recent writer, "and one of the influences to which the mind responds most readily. With it we make our homes appear light, cheerful, restful, feminine; or dark, formal, forceful, masculine; with it by variation of hue and intensity we create an atmoshere most suited to a room and to the nature of those who occupy it."

Through the decades of the nineteenth century, which might be called the dark decades, corresponding in a way to the dark ages of longer ago, color was eschewed as being barbarous, or perhaps vulgar. As a matter of fact, the word **vulgar** comes from the good old Latin word meaning the common people. It is barbarous in the sense that a primitive people love pure color and do not put themselves under any restraint in the use of it. An older civilization is more subtle in its use of color and more sensitive to the influence of one color on another.

Modern research tends to show that the antique world was a riot of color. The Egyptian tombs, which have been saved for us, are full of color; we are left to judge what the world of the living must have been, on through Greek and Roman times. "In man's minds for thousands of years there never arose any qestion of a divorce between form and color; their union was taken for granted. The Renaissance worshipped at the feet of antiquity, yet never thought of banishing color, but two hundred years later," quoting from Edwin Howland Batshfield, "there grew, almost suddenly an impression that the art of the Greeks and Romans was a white art or a stone colored art at most.

"We know the stone, mosaic and colored marbles of Rome; we see how fundamentally the Byzantine temperament expressed itself in tesserae of vitreous paste. To recall the solemn magnificence which may be imparted by color we have only to remember Constantinople, Ravenna, Venice, Palermo. The Romanesque churches, with their wide spaces of interior wall-surfaces were once a blaze of color and we may be sure that the purity and flatness of that color was in inverse ratio to the size of the window apertures, for darkness demands flatness and purity in order that we may have force. Fra Angelico's Angels, just little spots of vermilion, or strong blue or gold, are suited by art to the semi-darkness of the convent wall, just as the blind fish are suited by nature to the total darkness of Mammoth Cave.

"Today you may trample color under foot in the bits of broken glass and pottery which are ground into the soil under the palm groves of Memphis; you may scrape it from the walls of Etruscan tombs; you may see it in the mosaics of early Christian centuries, the true 'painting for eternity'; everywhere color, color, color. In the past all the world learned the lesson; shall we neglect it?"

The play of color in Oriental rugs and other weaves is the climax of generations of study and feeling for color in its juxtaposition, where patterns have been repeated—not through rote but through sensitive traditions, coming down from generation to generation with the pride of family or tribe and of skill.

Pioneer in tapestries and in tapestry weaving in this country are the Herter Looms in New York City, and they are showing the possibilities of America, even in this venerated craft. Albert Herter says:

"Almost the first requirement of good color is that it should be 'clean.' For several generations back all freshness of color seems to have been regarded as alarming.

"It seems very possible," he continues, "to make combinations as I have tried to do in fabrics, where there is what painters call broken color throughout, giving to the surface, however gray, a luminous quality. This is what happens in the best Oriental rugs, where the mosaic of color is in scale with the size of the decorated surface and the mingling of many spots bright in themselves makes for a colorful grayness that is still full of life.

"Every part of an interior, every wall space, mantelpiece, corner or grouping of furniture should be a beautiful study in still life, its elements so juxtaposed as to make in itself what is called a picture—a paintable thing just as it stands, with lights and shades, harmonies and contracts, accented or plain surfaces as in a well composed and balanced canvas.

"It is this studying of the problem as an *ensemble*, this subordination of detail, which should be the artist's work in the creation of any room, and it is in this most essential quality that the amateur or the commercial and untrained decorator makes the flagrant mistakes of assembling objects which, however good in themselves, are unrelated.

"The obvious consequences of ill-considered combinations is a subtle irritation, an unrest, which carries its inevitable but usually unanalyzed reaction. For some reason the ear protests against discord in sound, while the eye adjusts itself more easily to disharmony, and fails to recognize what is subconsciously a factor of unrest and nervous strain—accepting an equivalent of what in music would be unendurable. As color is the emotional attribute of the graphic and applied arts, it is its misapplication or entire neglect that is responsible for that vague sense of discomfort or actual *malaise* that many interiors produce, whereas without critical analysis we are often actually pleasantly affected and even cheered by the right placing of restful or gay color.

"Not only is it necessary that color should be carefully studied in all weaving and rug making, but in all the smaller accessories for the making of a home. I have recently studied some very interesting changes of effect in semi-transparent fabrics and tapestries. For instance, if tapestry is put in the half circle head of a large window which would otherwise be impossible to drape, it becomes opaque at night, revealing all the rich tones employed in the weaving, but in the day time the open mesh warp permits light to flood through, bringing out the design in silhouette on a transparent color background. This is not a new invention. It has been done recently in Sweden.

"The semi-transparent tapestries are extremely interesting hung at a doorway or window with light at the back illuminating the texture; at night the transparent quality is entirely lost and the richer tones made conspicuous.

"The more I work in the weaving of tapestries and fabrics; in the designing of hangings; in the combination of colors; in an appreciation of the beauty of fabrics made luminous with light streaming through them or rich and opaque against solid backgrounds, the more I appreciate the fact that we have not commenced to apprehend all that may be done with color, texture and line; that the days are not long enough for the development of new beauty for the furnishing of our homes.

"I feel that the time has come when absolute imitation of any period in architecture, furniture or decoration is not greatly valued except for educational purpose. We are becoming more and more a developed personality as a nation, we are losing our provinciality, we are ceasing to be fearful of our own expression; in other words, the American has developed an outline. This outline is developed in his more definite taste in music, drama, his architecture and the fitting of his home.

"Above all things the American interior today should be comfortable and cheerful. I think that the use of painted wood is going to bring a delightful color note into our homes. Everywhere we are working for the beautiful thing that is more individual and of necessity useful and comfortable."

Strikes as Old as Pyramids

IF the prevalence of strikes is an indication of the progress of the twentieth century, states an interesting paper in the N. Y. *Evening Sun*, ancient Rome and Greece left us at the post. For not only does history record instances of labor unions and strikes of actors, masons, bakers, miners and other artisans that plied their trade in ancient cities, but our ancestors went a step further and harbored a union of poets, which, according to one tradition, was honored by the membership of no less a distinguished bard than Homer, the author of "The Iliad," or, as some have it, the compiler of that epic.

Time worn inscriptions on stones gathered from every corner of the antique world—Syria, Mesopotamia, Greece, Sicily and Etruria and preserved in museums, indicate that all ancient trades, particularly that of masonry, enjoyedf the highest organization and power. Egyptian hieroglyphics also furnish numerous records of strikes similar to those taking place today. They show that the labor organizations in Rome exercised tremendous political power and were led by powerful labor leaders.

The first great strike in the world's history so far as is known occurred more than three thousand years ago, according to M. Maspero, the Egyptologist. He records a strike of masons engaged in the building of pyramids and temples during the reigns of the Pharaohs. He relates that these artisans were powerfully organized. While engaged in excavating and deciphering picture writings of the Egyptians, M. Maspero came across the following interesting inscription:

"On the tenth day of the month builders at work on the temple rushed out and sat down behind the

chapel exclaiming: 'We are hungry and there are yet eighteen days before the next pay day.'

"They would not work until the King agreed to hear their complaints. Two days later Pharaoh went to the temple and ordered relief given the masons; but the sixteenth day they quit again, and on the seventeenth and eighteenth days they also refused to work. On the nineteenth day they raised a mob at the Governor's palace and finally got their demands."

Historians state that Greece possessed unions of the Bacchic or Dionysian artists at least 400 years before Christ. Dr. Foucert points out in his researches that many poets were members of the union, and he ventures the belief that Homer belonged to the collegium, as the union was called.

A powerful branch of the organization was that of the musicians, who, it appears, were employed by the Athenian Government. Tentmakers of the Dionysian artists, who furnished the paraphernalia of the theatres and corresponded to the modern stagehands, were also powerfully organized.

An interesting account is given by historians of a strike of the Athenian musicians, who refused to perform at the most important festival of the Government because they wanted compensation for their services.

The musicians in Rome belonged to a powerful political body of many trades. This organization elected the city commissioners of public works. During one of the Samnite wars, in the year B. C. 309, and at the moment when the Romans wanted more money than they could collect, the officials of the city refused to permit the musicians' union to play at a festival to Jupiter at the expense of the city. The lordmaster of the union immediately convoked the advisory board of the organization, which voted a strike. Forming a column, the musicians took up their march to a distant town across the Tiber.

An ancient historian gives this account of the strike and its settlement:

"The Senate of Rome sent a commission to the neighboring town of Tiber, now Trivoli, to ask the political council of the place its co-operation and intercession with a view to induce the musicians to come out of their sulks, return to the feast and give Jupiter the music for nothing. The reception was friendly, negotiations were immediately opened with the strikers, but in vain. The workmen were uncompromising. All solicitations were refused. It was now the very day before that set for the feast. Fear that the gods would envelop them with wrath began to make the Romans tremble. A strategem was agreed upon.

"The musicians were to be asked to give a concert. At that pompous display they were to be inveigled into accepting libations, which they seldom refused. Stuffed with wine, and when all were unconscious with inebriation, they were to be taken bodily into cushioned chariots back to the Eternal City and landed safely at the Forum, where all was in readiness for the sacrifices of the morrow.

"The multitude is a greater moral power to the workman on strike than the councils of the great. And when they awoke from the stupor and found themselves suffused with a friendly hurrah of nearly all the population of Rome gushing with flatteries around them, then they imbibed the full force of the joke by which they had been outwitted. They consented to play, but not until a stipulation was agreed to, permitting them annually in the future to hold a jubilation on the 13th day of June and march with their red flag and carnival uniforms throughout the streets, clothed with an accredited permission to solicit contributions for their benefit."

A record of a strike of bakers in ancient times is furnished by Egyptian hieroglyphics deciphered by a famous scientist.

Another account incidentally shows that centuries before our era began bakers were powerfully organized in the old cities.

The bakers of two cities, Magnesia and Paros, in Greece, the records show, struck work and refused to bring to the regular market the usual supply of bread, owing to a grievance that is not made plain. The city council, after becoming aware of the strike, convoked an extra session with the result that the strike leaders were arrested, and the organizations disrupted. The Governor issued the following proclamation: "Any baker who shall associate himself with meetings, or who shall excite sedition leading to trouble, or who shall secret himself, or any one who shall furnish another with a hiding place, will be severely punished."

In the year 413 B. C. a strike of 20,000 miners occurred in the State of Utica, whence the Government of Athens derived its gold and silver. The strikers abandoned the mines and escaped, hiring themselves out to another government against their own country.

One of the most powerful of labor unions in the Roman Empire was that of the image makers. The membership was particularly powerful in Ephesus, the great manufacturing and commercial city of Phrygia, which also possessed many other trade unions. The president of the image makers was Demetrius, a powerful leader, who exercised great influence over the town clerk, the Government and the people of Ephesus. The image makers were also the jewelers of modern times, and they made

the rings and bracelets for the ladies of Rome and the decorations of the pagan gods.

One of the earliest labor speeches in history was made by Demetrius and is duly recorded in the nineteenth chapter of the Book of Acts of the Apostles of the New Testament. The speech, which charged that the doctrine preached by St. Paul would take away the living of the image makers, resulted in a tumult of the people.

"And with one voice they all cried out about the space of two hours 'Great is Diana of the Ephesians!'"

"Demetrius was the first open, original exponent of the purely economic plan of Asia," says a historian. "The laborer must receive the equivalent of the product of his work, and Demetrius said St. Paul's condemnation of idolatry should not interfere against it."

"The Man Who Loved London"

SATIRE, well and intelligently directed, will often secure greater reforms than the best considered, most thorough arguments.

Our English brethren have a way of pointing out necessary reforms that, while starting the risibility of the public, also start them seriously thinking in the direction desired.

An excellent example is furnished in what *The Architect's Journal* of London describes as a rather grimly humorous short story by Mr. J. S. Fletcher on the current issue of a London journal. It recounts the experience of a certain First Commissioner of Works who spent his week ends in seclusion. Continuing, *The Architect's Journal* states in reviewing the story:

"Unobtrusively clad in an old tweed suit and carrying his own bag," he would go off to a rustic inn which was seven miles from the nearest railway, and "was an old—a very old—house. It had a thatched roof and diamond-paned windows." But its age, its roof, and its glazing had no more to do with the case than had its "old-world garden, full, at the proper time, of hollyhocks, and thyme, and big, thoroughly English, red roses." Neither the inn nor its garden comes into the story. They are simply "decorative effects." The real business begins on the bank of the fishing pond, where the First Commissioner, disguised as "Mr. Jenks," is discovered by an elderly gentleman calling himself the Man who Loved London. To Jenks he reveals his wish "to see London swept clean of all the hideous, vile, abominable atrocities which disfigure her! London, sir, would be the most beautiful city in Europe if she were purged of certain eyesores." "Such as what?" asked Jenks. "The railway bridge at Charing Cross," promptly replied his companion. "Sir, that bridge is an offense! It is enough to bring down on us the thunder of the gods!"

Then the "so-called statues to our public men" are condemned by this elderly iconoclast, who reviles also "that truly awful thing known as the Albert Memorial," while the statuary in the Abbey and in St. Paul's should be broken up, the Crimean Memorial blown up, the Achilles statue ground to powder. "As for the Surrey side of the river, the entire frontage from Lambeth to Deptford should be completely swept away—by dynamite if necessary." He would remove by violence—with as much noise as possible—the Bank of England ("because it is utterly stupid that such a poor obscure featureless place should house our main stores of wealth") and St. Paul's (several quite intelligent people believe it to be a warehouse, while foreigners invariably take it for a bourse—"it must be blown up, and something Gothic put in its place"). If the First Commissioner will not do his duty, something will happen. Things began to happen by some person or persons unknown striking off the head of the statue of Queen Victoria at Kensington. Then the statue (by Scraper, R. A.) of Field-Marshal MacGrowther, in Waterloo Place, was shamefully maltreated with a sledge-hammer. The Queen Anne group in front of St. Paul's was blown to fragments. Finally, when the House of Commons was crowded with listeners to a glowing peroration by the Prime Minister, the shock of a terrible explosion threw him half-way across the table, extinguished all the lights, and whisked the Speaker's wig off his head. "It's Charing Cross Railway Bridge! Charing Cross Railway Bridge has been blown up! Charing Cross Railway Bridge. Blown to atoms!" Friends, do not weep. This is only a story. And we sternly repress the desire that it should come true. Our office, having been built in the eighteenth century, is not so strong as it was in its lusty youth; and Charing Cross Railway Bridge is too near to be pleasant, whether in view of such contingencies as those imagined in Mr. Fletcher's story, or whether left unpunished.

Book Note

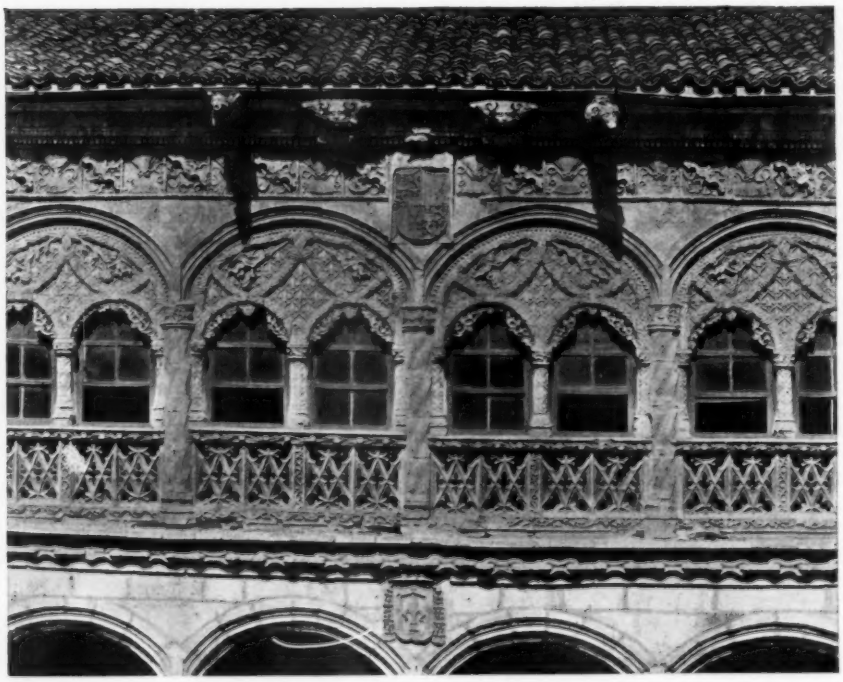
Art and the Great War

Since local artists contributed generously to the work of the division of pictorial publicity during the period of the war, the volume, "Art and the Great War," by Albert Eugene Gallatin, relating to the activities, will be of more than passing notice Mr. Gallatin organized the committee on arts and decoration of the mayor's committee on national defense in New York, and gave personal attention to movements in connection with these war measures. His book is richly illustrated. It was only late in the conflict that the Government realized the value of art in promoting the war. In his preface Mr. Gallatin says:

"The purpose of this book has been to chronicle the part played in the great war by painters, illustrators, etchers, lithographers and sculptors, acting in these capacities. Their services were of great value and certainly deserved to be recorded.

"I have endeavored to show what the artists of the United States, Great Britain, Canada and France have done, both in depicting scenes at the actual front and behind the lines, recording the work of the navies and the aviation corps, as well as depicting scenes in the shipyards, munition factories, industrial plants and work on the land. I have, too, tried to show the important service rendered by the poster artist, the cartoonist and the camoufleur.

Among the artists whose works are reproduced are the following: Muirhead Bone, Sir William Orpen, C. R. W. Nevinson, James McBey, G. Spencer Pryse, Forain, Steinlen, Lucien Jones, Renoir, Raemaekers, George Luks, George Bellows, Maxfield Parrish, Paul Manship, Childe Hassam and the eight official American illustrators.



DETAIL OF PATIO OF SAN GREGORIO, VALLADOLID

Editorial Comment

The Chaos of Our Governmental Building Operations

THE largest single agency in this country engaged in construction is now and has been for a number of years the United States Government. But in conducting its large building operations the Government does not function as a unit, but as nine or ten units.

In the Treasury Department there are the offices of the Supervising Architect and Coast Guard Construction; in the Department of the Interior, the Reclamation Service, the National Park Service and the office of the Indian Affairs act in these matters; in the Department of Agriculture there are four branches: Forest Service, Weather Bureau, Bureau of Animal Industry and the Bureau of Experiment Stations; and in the Department of Commerce there is the Light House Building Bureau.

In each of these groups certain types of buildings are of like character; hospitals might be cited as an example. These buildings require special investigations and studies, and yet we find this work handled independently by the Treasury, Army and Navy Departments.

These conditions, of course, entail waste, loss of time and consequently a considerable and unnecessary expense. It is not conceivable that any of our large building organizations would maintain a number of organizations, each independent of the other. That, however, is exactly what this Government does. Centralization is the key note of the success of privately conducted organizations, and the ability successfully to continue is dependent on this centralization.

In every department of our Government under the direction of a cabinet officer there are at present certain bureaus or "offices" under which the building operations are conducted. Thus, as will be readily apparent, there is a constant duplication of effort and confusion of methods, not to take into consideration the "red-tape" and conflicts of authority when these departments overlap as they very often do.

There is today no way accurately to visualize the Government's entire building operations, determine its needs or to apply the best solution of its problems. There is pressing need for complete reorganization, under one specific department, of all the building operations carried forward under Government control. Pending such reorganization we shall continue in the present wasteful and inefficient way as now characterizes our national building.

Problems for the Architect to Solve

FOLLOWING closely behind the labor situation in point of importance in the present construction difficulties to be faced by architects all over the country comes the unsettling factor of securing building materials.

With contract after contract broken by numerous trades and with common labor getting 85 cents per hour in certain sections there now arise added difficulties in getting prompt and efficient deliveries of materials to the point of work. Many architects are charging the trouble to railroad inefficiency. They say it is quite evident that the railroad officials have passed the word to confuse the transportation business to such a degree that everyone will become disgusted with Government control of the railroads.

An illuminating example of the troubles now being encountered is of interest as showing the seriousness of the problems that architects have to meet. A prominent firm of Chicago architects recently had a carload of facing brick consigned from one of the yards in Crawfordsville, Ind., only 125 miles from Chicago, located on the Pennsylvania system. The car left Crawfordsville, but in spite of all the tracing and inquiries that could be made it could not be located until 32 days later, when it was found in the yards of the Pere Marquette at Detroit. Another car which left on the same train from Crawfordsville on the eighth of September was finally located at Hammond, Ind., on the fifteenth of October.

In another recent case this firm had a carload of brick that left Dayton, Ohio, for St. Joseph, Mich., consigned to the Pere Marquette at Detroit that required twenty-eight days to travel from Detroit to Grand Rapids, Mich. By the most strenuous efforts of the general superintendent of the Pere Marquette the railroad was able to move it from Grand Rapids to St. Joseph, about 85 miles, in seven additional days.

These are not unusual incidents, architects say, but are fair examples of what they have to contend with when they are trying to the best of their ability to complete a building within a certain time.

This action on the part of railroad officials would suggest the question as to whether it is advisable further to continue educating the public in lessons as to the poor results of Government administration of private utilities. Why should this action be allowed to retard the normal resumption of building operations, now so seriously delayed, as further to cripple one of our most important and essential industries?

American Goods and Foreign Markets

JUST how completely the Prophesy as to magnitude of post-war American exports to Europe made in these columns in the early summer of 1918 has been fulfilled is shown by statistics brought out at the recent International Trade Conference at Atlantic City. A year ago last July THE AMERICAN ARCHITECT pointed out editorially that the United States would be called upon to assume heavy burdens in fulfilling its part in the resumption of normal conditions of commerce.

At that time it was said: "The after-war demands will be immediate, and it is logical to assume that to this country Europe will turn at the *outset* for all its many and pressing needs."

The demand from Europe has fully borne out this statement. We are sending to Europe to-day foodstuffs, partly or wholly manufactured, and finished products to the amount of $500,000,000 in one month. We have been sending goods chiefly for immediate consumption rather than those things which she could use to set her industries going. Figures which show the enormous excess of American exports were contained in an address before the trade convention by James S. Alexander, president of the National Bank of Commerce. He said:

> "In the ten months preceding the armistice so far as the published figures go, our exports exceeded our imports by about $248,000,000 a month. Since the armistice the figures have risen. In January our export balance was $409,000,000, in April it was $442,000,000, in June it rose to the astonishing figure of $625,000,000. Exports in that month were $918,000,000 and imports were $293,000,000. Our average export balance for the first eight months of 1919 was around $400,000,000 a month. All of this excess, and something more, has been in our trade with Europe. Thus, in April we sent Europe $500,000,000 worth of goods and received back from Europe $43,000,000 worth of goods, a balance of $457,000,000 where our balance with the whole world was $442,000,000.
>
> "It is axiomatic that what is bought must be paid for and that nations engaged in foreign trade in the long run pay for imports by exports. The existing unpaid and unbalanced state of trade between America and Europe has been made possible by credits granted by the United States Government to the governments of Europe. These credits have largely ceased to be available for the support of the export trade, and our exports are now going to Europe largely on open account. There has come, as a consquence, a dramatic break in virtually all the European exchange rates, and the foreign exchange markets are badly demoralized. It is recognized on the part of all of us that in the absence of special emergency measures the exchange rates will continue to fall until American exports to Europe are so checked that imports will pay for them.
>
> "In addition to paying for her excess of imports over exports Europe has the problem of meeting interest payments in the United States, and the problem paying maturing capital obligations."

American business men are generally of the opinion with regard to the present status of American foreign trade that the scale at which exports are moving to-day will probably not continue for many months. The immense demand which followed the re-opening of the sea routes is already slightly decreasing.

If sales are to continue they must be financed on a broader basis than heretofore, says the Guaranty Trust Company of New York. If they are not so financed, there will be a tendency, certainly in the field of manufactured products, for trade to drift back to the channels which were used before the United States was projected so dramatically upon the scene. Indifference, or even lukewarmness on the part of the American exporter will lose for him the advantage he has gained. This is the physological moment for action by Europe. It is no less the physological moment for action on the part of American business and industry.

PLATE 149

WALTHAM PUBLIC LIBRARY, WALTHAM, MASS.

JOSEPH D. LELAND AND CHARLES G. LORING, *ASSOCIATED ARCHITECTS*

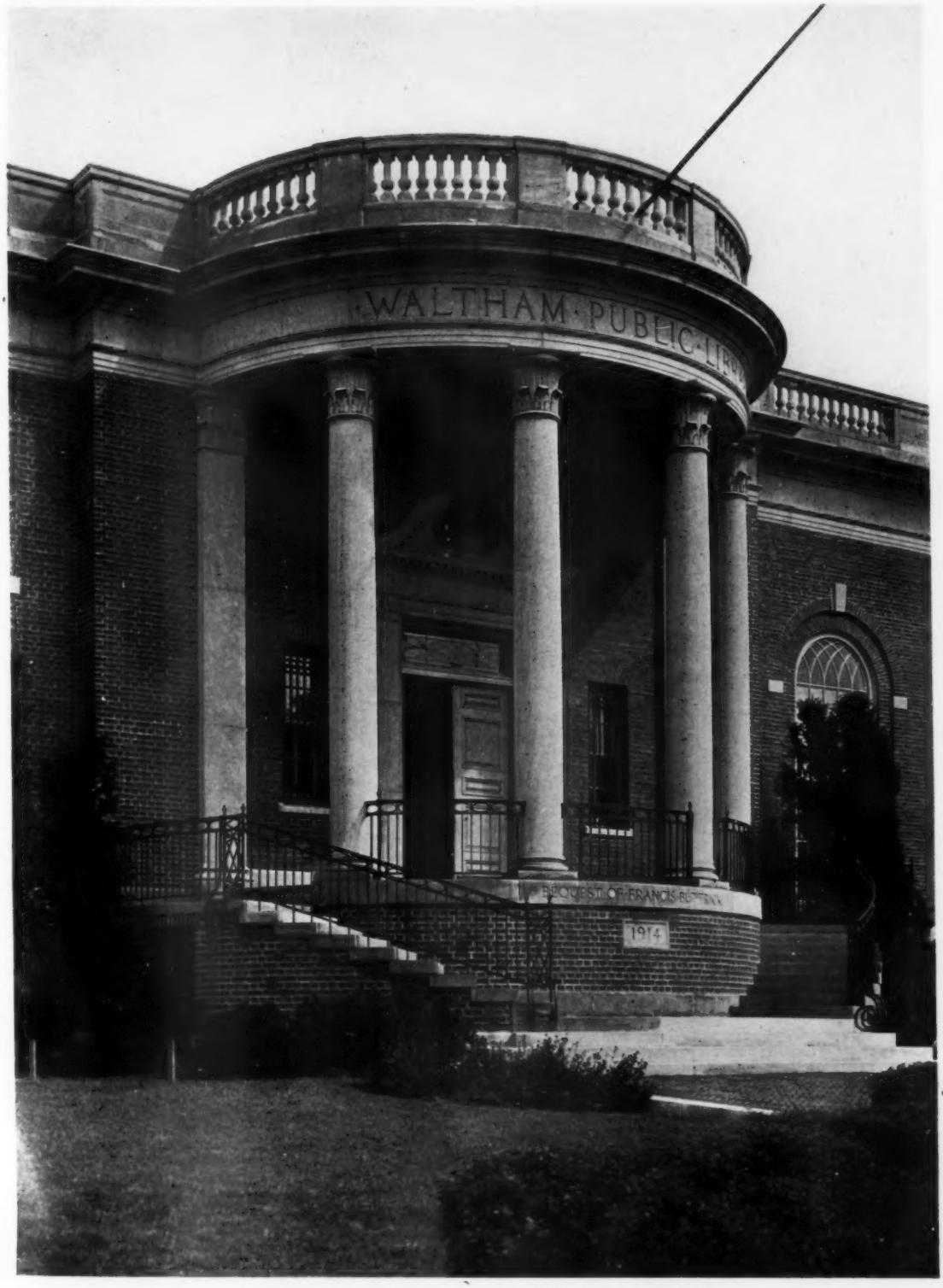


PLATE 150

WALTHAM PUBLIC LIBRARY, WALTHAM, MASS.

JOSEPH D. LELAND AND CHARLES G. LORING, *ASSOCIATED ARCHITECTS*

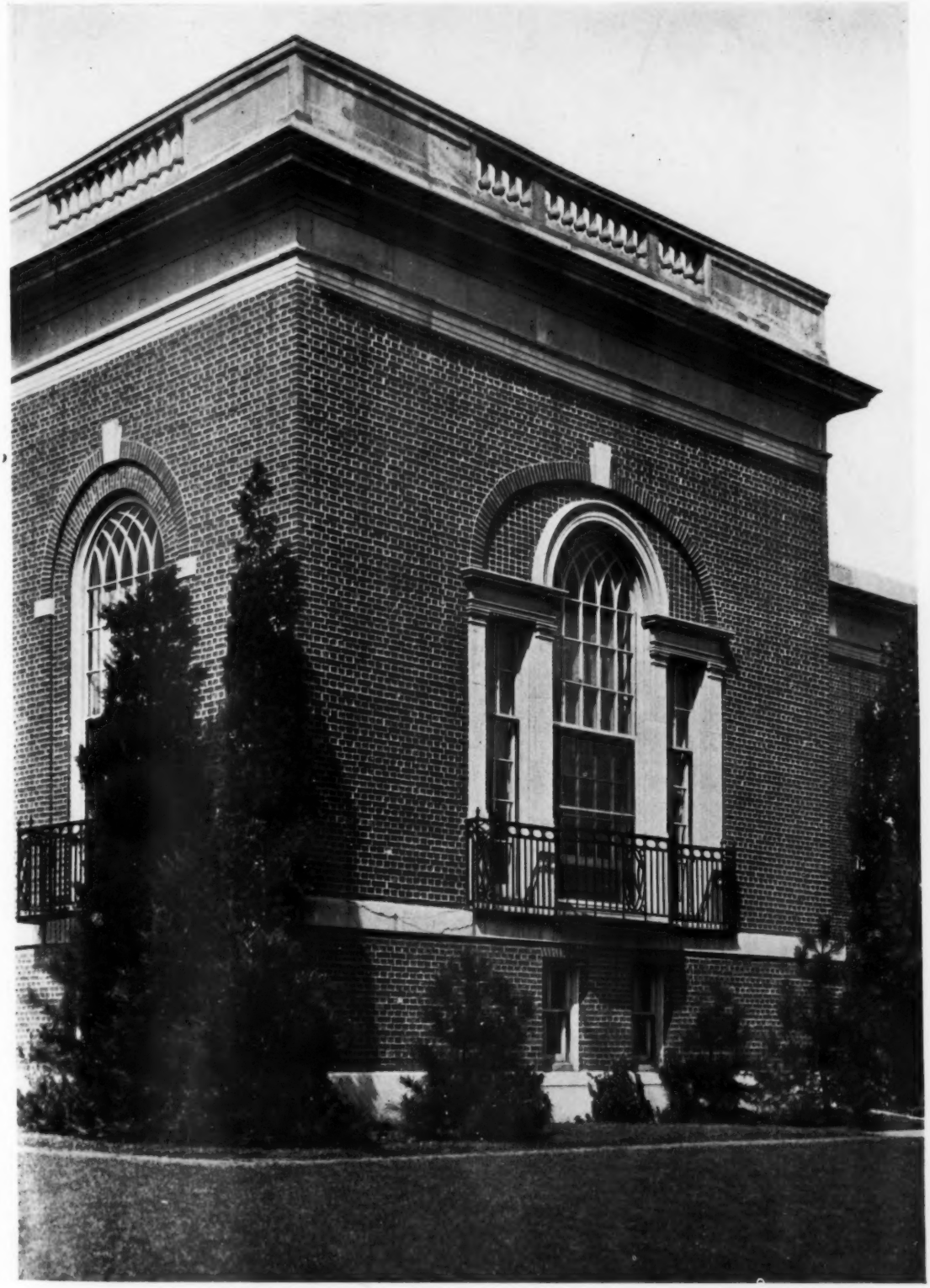


PLATE 151

WALTHAM PUBLIC LIBRARY, WALTHAM, MASS.
JOSEPH D. LELAND AND CHARLES G. LORING, *ASSOCIATED ARCHITECTS*

CIRCULATION DESK

GENERAL READING ROOM

WALTHAM PUBLIC LIBRARY, WALTHAM, MASS.

JOSEPH D. LELAND AND CHARLES G. LORING,
ASSOCIATED ARCHITECTS

PLATE 153

HOUSE OF A. W. BLISS, MARION, MASS.
COOLIDGE & CARLSON, *ARCHITECTS*

DINING ROOM

LIVING ROOM

PLATE 154

HOUSE OF A. W. BLISS, MARION, MASS.
COOLIDGE & CARLSON, *ARCHITECTS*

PLATE 155

HOUSE OF F. H. KENNARD, NEWTON CENTRE, MASS.

COOLIDGE & CARLSON, *ARCHITECTS*

Current News

Late Happenings and Comments in the Fields of Architecture and the Allied Arts

Exhibition of Industrial Art

The American Museum of National History in New York announces an exhibition of industrial art, with special relation to textiles and costumes. This exhibition will bring to the attention of teachers, students, professional workers and the general public the surprising advances made in decorative industrial art during the last five years. When the great war began American manufacturers were thrown on their own resources by the closing of the centers of design in Europe. As a result of this deprivation, goods of high artistic merit, in every sense American, are now being made in the United States, where previously the lead of Europe was implicitly followed. The period of doubt and experiment is now over and a pathway of future advancement is clearly indicated toward the goal of a truly national art.

The exhibition will cover a variety of subjects. A salon of costumes by creative artists in woman's dress will be a popular attraction, as well as a display of striking designs in dress silks and cottons, draperies, ribbons, etc., manufactured by leading American textile houses. The inspiration for these creations often find their sources in ethnological specimens in museum collections. Designers for the most progressive houses in America have studied carefully the examples of applied art of different ages and peoples on view in the public museums of New York, and have drawn therefrom many ideas of practical value.

On the side of mechanics, the relation between ancient and modern machinery will be brought out in the history of the loom, of block printing, of embroidery, and of other methods of weaving and decorating cloth. Several modern textile machines will be shown in actual operation. Batik, tie-dyeing and other handcrafts will be fully treated by examples in process. Nearly all the technical features of modern weaving go back to primitive times and there are many ancient types of textile construction that cannot be done with modern machinery.

At this time selected specimens will be brought together from the various collections in the American Museum to show the fundamental relations between design and construction. Material to be used by teachers and students of art in the schools of New York is now being prepared in the American Museum of Natural History, in co-operation with the State Board of Education.

Construction Increases in England

Reports from London on present prices of building materials, as compared with pre-war quotations, show that the cost of ordinary buildings consists approximately of 60 per cent for materials, while labor has advanced 40 per cent. The present labor output is estimated to be reduced about 20 per cent, due to war influences.

Applied Art

"Applied Art" is the name of a new periodical, the first volume of which has just been issued. It is edited by Herbert E. Martini, and has Heyworth Campbell, M. D. C. Crawford, J. Cotton Dana and H. A. Weissberger for honorary editors, whose function in this volume is to provide several pages of letterpress for the fifty plates showing the tendencies of American industrial art brought together in convenient portfolio form.

The plates cover such subjects as advertising posters and cards, stage decorations, magazine covers and illustrations, decorative silks, bronze reliefs, etc., with two or three given to the sources from which American designers of the modern type draw their inspiration. Thus a very beautiful plate printed in color has for its subject four pieces of Peruvian pottery drawn from the collections of the Hipanic Society. Another illustrates a Czechoslovac interior.

The idea of using the plates or any other reference material as a means of piecing together pseudo novelties in the special lines illustrated is strongly deprecated by the editor, who says in his preface: "Reference works should give the impetus to study the sources of the inspiration. Conventionalizing a conventionalized form is only rethinking someone else's thought. It leads to plagiarism; it stultifies observation, it deadens originality, it devitalizes enthusiasm and conviction.

"The evolution of stone architecture from wooden architecture, the adaptation of the lotus and acanthus to the capital of a column were all the result of knowledge and inspiration from the close scrutiny of nature. Can we not apply such knowledge to our immediate environment sublimated with our national characteristic and aesthetic demands? Yes, we can if we are honest and work hard to wring our inspiration from an exhaustive study and analysis of the fount of all art knowledge—nature."

The other writers in their brief but extremely pertinent articles emphasize the necessity of taking industrial design as seriously as the study of any other form of art, of gaining a thorough knowledge of fundamental principles and giving constant attention to detail even when the work to be produced is seemingly superficial; of designing with the actual materials and their relation to surrounding objects in mind, of familiarity with the vairous techniques of production.

Workers Leaving the United States

During the month of June, 1919, the number of persons who left America for Europe averaged 1,000 per day. These consisted chiefly of people from the laboring classes, the greater portion going back to remain in their native countries. In a single day, 5,000 Italians, mostly men, left New York for their home land. Cheaper property, better wages and lower cost of living are expected abroad, as

well as a chance to aid relatives and help in the rebuilding of their country. The amount of money taken along by each of these returning immigrants undoubtedly is large and will prove a serious drain on the wealth of the United States if, as is expected, this exodus continues for any considerable time. But it is not alone the loss of this money which will create a serious condition, it is the reduction in the number of common laborers which are and will be so greatly needed here. Possibly this explains why common laborers are able today to demand and receive a daily wage of $5 and $6.

Boston Architectural Club Announces Plans

Plans were perfected by the Boston Architectural Club at its annual meeting for a joint exhibition of allied arts to be presented next spring on a larger scale than ever before attempted in Boston. This is the result of correspondence with the British Institute on Industrial Art and will be held in collaboration with the Boston Society of Printers and the Society of Arts and Crafts.

The club has planned an unusually large program for the coming season, including classes for elementary, intermediate and advanced design, architectural construction and a life class. There will also be fortnightly lectures on architectural history.

These officers were chossen: President, W. R. Greeley; vice-president, N. H. Larsen; secretary, Davis W. Clarke; treasurer, Louis C. Newhall; directors, F. E. Clayton, Ralph Gray and W. G. Gilmore.

University of Virginia Gets School of Fine Arts

A new branch of instruction will be initiated at the University of Virginia in the coming session by the opening of the school of fine art, made possible by the gift of Paul Goodloe McIntire, an alumnus of the class of 1879, of $155,000 to endow a special school of fine art, embracing art, architecture and music. It is planned first of all to provide, as part of liberal training for students in the college, courses in the history and interpretation of art through the great styles of the past, and in drawing and painting as a means of expression scarcely second to language.

St. Louis Men Form Building Corporation

In an effort to combat the house famine, prominent business men of St. Louis, Mo., have formed a $2,000,000 corporation to build homes and sell them to the laboring class on the twenty-year payment plan. Construction of the homes will begin shortly, it is stated.

Japanese Rent Profiteers

The renting agents of Kobe, having been accused of extorting higher rents without the consent of the owners of the houses, have brought down upon themselves strict regulations by the Governor, according to the bulletin of the Japan Society. The new rules specify that rental agencies must not be conducted by "minors and incompetents, people who have been sentenced to more than one year's imprisonment (unless sincerely repentant), unredeemed bankruptss and persons of bad behavior and dangerous to public morality."

Hotels for Babies

Hotels for babies is one of the newest schemes in Britain, the idea having originated as the result of the war. These hotels are intended for the accommodation of young children in emergencies whose mothers find it impossible to stay with them. One, with accommodations for children up to seven years of age, will receive only children from the professional class. The charge will be from one to two guineas a week, and they will be taken for a year or more. A Montessori teacher will look after their educational needs.

Another hotel will be for the use of children of the working classes. Fifteen can be cared for at a charge of 10 shillings a week. Their stay is limited to one month, the intention being to provide temporary accommodations for children whose mothers are ill, or who have died, and whose fathers cannot care for them adequately.

Yale University to Build Library

A great library to cost approximately $5,000,000 will soon be erected at Yale out of the funds made available by the bequest of the late John W. Sterling. No decision has yet been reached, but the Sterling will provide for some building as a memorial to the donor, and it seems to be generally agreed that the university's most pressing need in the line of new construction is a hall where its book collections may be housed.

London Forced to Erect Skyscrapers

The old question of whether London is to have skyscrapers is being revived because of the high price of property in the business section and the lack of space in office buildings.

The government buildings in Whitehall are four stories high, but it has been found necessary to add a story to the War Office to meet the demands of the department. One well known architect in touch with the government's plans expressed the opinion that unless the new and the old ministries were content to do their work outside of the area devoted to governmental activities, skyscrapers were inevitable in Whitehall.

Generally speaking, however, London does not like tall buildings. Percy Tubbs, past president of the Society of Architects, declared that if the skyscraper were to come it would be necessary to widen the streets.

"But space in London is not so scarce as it is in New York, which is an island," he said. "I think the traffic problem will not become so unwieldy that we shall be afraid to let London expand any further outward and we will be compelled to expand it upward. Personally I always feel that where skyscrapers abound, the man in the street moves in the bottom of a well."

American architects in London erecting a huge department store have repeatedly asked for permission to extend the main building high enough to accommodate not only the present business of the concern, but to provide for the future growth as well, and have met with no encouragement whatever.

Caravan Mode of Housing

To such straits is the housing problem reducing people the world over, that solutions recently believed impossible are in some places being reluctantly accepted. A suggestion comes from England from the secretary of the English Caravan Club, that small houses on wheels be standardized and made cheaply in large numbers. Nearly four thousand are said to be already on English roads. If this is done, then surely, if never before, there will be "no place like home."

To Systematize Signposts

Attention is called by the *Architects' Journal* of London to the announcement that France is to simplify travel and communication by the insistent establishment of signposts. Hereafter, strangers may know exactly where they are, without depending upon the courtesy of another. It is proposed to have a large board at the entrance of each town or village, and it is "to be painted in large letters" on town halls, schools, railway stations and postoffices. The London paper very properly takes exception to the expression "large letters" in the official statement.

It would be better if nothing had been said about the size of the letters. Size, if it exceeds a certain relative scale, becomes hideous, and it is by no means synonymous with legibility, which is the word that the French Ministry of Public Works and Transports would have been more discrete to use. Legibility comes from shape, proportion, color, background—anything rather than size, which may be too large for a coup d'œil, the range of the eye being limited both perpendicular and horizontally. To take in at a glance a wide expanse of lettering is difficult and painful when it is not impossible; but there is a certain size of inscription that is both easy and pleasant to decipher. It is the business of the signwriter to find out from the oculists what size is, and then to conform to it. We have yet to grasp the broad principle of labelling our towns, villages, streets and public buildings. Surely it is in the highest degree uneconomical and absurd that a motorist should have to pull up to ask the ridiculous but necessary question, "What town is this?" or "What railway station is this?" And in still worse case is the pedestrian lost at night in a wilderness of suburban streets, many of which are very inconspicuously labelled, if at all. There is no resource but to "ask a policeman," or to interrupt the perambulation of the postman. Probably every reader of these lines has experienced the humiliation of getting lost in a maze of streets, and of having to enquire the way out. All this implies enormous wastage of time and temper; and the annoyance amounts to exasperation when one reflects that the remedy is so exceedingly simple, and would be so very much less costly than the troubles it would annihilate. No street corner should be without its illuminated label; which, indeed, should be more than a street name; it should tell whither the street leads, how its numbers run, and the whereabouts of the nearest ambulance, police station, fire alarm.

Building Materials Congress to Be Held at Christiana

According to the report of Trade Commissioner Nels A. Bengtson at Christiana, Norway, as shown in *Commerce Reports*, the Norwegian Association for Dwelling Improvements is planning to hold a building material congress, probably in January, 1920, at Christiana.

At this meeting lectures and demonstrations on plans and methods will be given, and in connection therewith will also be held an exhibit of building materials and home equipment. It is expected that nearly all the communes and building associations of Norway will send delegates to this meeting. The plans for the exposition of building materials are drawn on broad lines and provide the same rights and privileges to foreign firms that are granted to Norwegian exhibitors.

The announcement of the forthcoming congress is arousing much interest in building circles because nearly every city in Norway is facing a housing shortage and therefore it is felt that the near future must provide a period of active construction to meet the pressing needs.

The Work of Charles A. Platt

The work of Charles A. Platt, published in one long volume in 1913, has found a place in the working library of a large number of architects. The exhaustion of the first edition and the constant demand for this popular work has caused the publishers to issue a new edition, which can now be had for $15.00 net.

Orders for this book will be filled by the U. P. C. Book Co., 239 W. 39th street, New York.

The Merchants Association Year Book for 1919

The Merchants' Association Year Book for 1919 is now being distributed among the members of the Association in New York. The book contains a list of the members and officers of the Association. It also includes the by-laws and a chart, showing the plan of organization.

This report is of particular interest, as it embraces a large part of the very valuable war work undertaken by the Association. Enquiries should be addressed to Robert Fuller, manager of Publicity Bureau, Merchants' Association, New York.

San Francisco Society of Architects

San Francisco Society of Architects has elected the following officers for the year 1919-20: President, Mr. W. C. Hays; vice-president, Mr. Lewis P. Hobart; secretary-treasurer, Mr. H. H. Gutterson; directors, Messrs. Geo. A. Lansburgh and John Reid, Jr. Mr. Irving F. Morrow was elected to membership.

To Consider City Improvements

At a meeting of the Federated Civic Associations of New York, held recently, ways and means were discussed to solve the various problems affecting the welfare of the city.

Among the organizations represented were the Municipal Arts Society, the Fifth Avenue Association, the Forty-second Street Property Owners and Merchants' Association, the Brooklyn Chamber of Commerce, the New York City Federation of Women's Clubs, the Thirty-fourth Street Board of Trade, the Woman's Industrial League, the New York Board of Trade and Transportation, the Broadway Association, the Art Alliance of America, the American Scenic and Historic Preservation Society, the Washington Square Association, the Central Mercantile Association and the City Club.

Robert Grier Cooke was elected president, and Major Henry G. Opdyke secretary.

Personals

Victor P. Avansino, architect, is moving his office to 203 Citizens National Bank Building, Sedalia, Mo.

Victor P. Avansino has moved his offices to rooms 203-204, Citizens National Bank Building, Sedalia, Mo.

C. Howard Crane has moved from the Dime Bank Building, Detroit, to the Huron Building, same city.

The Sanoma Corporation and C. K. Sanborn Corporation now have quarters at 149 Broadway, New York.

A. L. O'Brion, architect, is just starting in business and has opened an office at 819 Shipley street, Wilmington, Del.

H. B. Kamshulte is now practicing architecture at the National Bank Building, Manitowac, Wis., and desires catalogues.

Kewanee Private Utilities Company is opening an office in the Fullerton Building, St. Louis, Mo., J. Albert Deyo of Kewanee in charge.

Mann & MacNeille, 70 East Forty-fifth street, New York, announce the opening of a branch office in the Book Building, Detroit, Mich.

Charles S. Watts has moved from 227 Gazette Building to 203 Hollenberg Building, Little Rock, Ark. Samples and catalogues are desired.

Herbert B. Rugh and C. B. Zalesky announce the formation of a partnership for architectural practice in the Security Building, Cedar Rapids, Ia.

William E. Haugaard has opened offices for architectural practice at 185 Madison avenue, New York, Charles H. Mills, Wilmington, Del., associate.

Charles S. Watts has changed his address from 227 Gazette Building to 203 Hollenberg Building, Little Rock, Ark. Catalogues and samples are requested.

James R. and Robert W. Stewart are now home from service abroad and associated as architects and engineers in Lincoln Inn Court, 519 Main street, Cincinnati, Ohio.

Edwin H. Lundie announces withdrawal from the firm of Stifer, Lundie & Abrahamson and the opening of his office for the practice of architecture at 532 Endicott Building, St. Paul, Minn.

I. L. Wright and Slack W. Winburn have formed a partnership for the practice of architecture, with offices in the A. V. Scott Building, Idaho Falls, Idaho. Catalogues and samples are desired.

Scott Lehman, formerly of Chicago and Detroit, and William G. Wuehrmann, A. I. A., of Chicago, have formed partnership for architectural practice at 204 Reynolds Building, El Paso, Tex.

Charles F. Ackerman and August Sieder, Jr., announce the formation of a partnership for the practice of architecture at 45 Clinton street, Newark, N. J. Samples and catalogues are requested.

Lous Svarz, formerly located in the Haight building, Seattle, and recently of the United States Field Artillery, has reopened offices in the Seattle National Bank Building for the resumption of architectural practice.

The Osborn Engineering Company of Cleveland, Ohio, incorporated for almost thirty years as consulting engineers, has recently organized a department of architecture and is offering professional services in that field.

The firm of Charles H. Higgins, 19 West Forty-fourth street, New York, announces that Capt. Joseph R. Greenwood, recently discharged from the army, has renewed his association with the firm, which was interrupted during the war.

Engineer Ellis W. Taylor has returned to Los Angeles after service in the United States Navy for the past two and one-half years. He is now associated with his brother, Architect Edward C. Taylor, with offices at 607 Merritt Building.

John P. Krempel and Walter E. Erkes, architects and engineers of Los Angeles, will move their offices from the Henne Building, to suite 538-539 Bradbury Building The new offices are being remodeled and will be occupied by November 1.

Waggaman & Ray, architects, formerly of 1742 M street, N. W., Washington, D. C., have moved to 1147 Connecticut avenue, N. W., Washington, D. C., and John M. Donn has opened a new office at 1147 Connecticut avenue, Washington, D. C. His office was closed during the war.

W. E. N. Hunter, 1306 Chamber of Commerce Building, and Niels C. Sorenson, 500 Congress Building, Detroit, Mich., have combined their offices to engage in architectural practice at 1306-07 Chamber of Commerce. The firm will specialize in ecclesiastical and institutional work.

The architectural firm composed of H. E. Hannaford, C. E. Hannaford, H. Eldridge Hannaford and Herbert Spielman, doing business as Samuel Hannaford & Sons, has been dissolved. Mr. Spielman will retire and carry on an independent practice. The remaining partners will continue under the present name, in Cincinnati, Ohio.

George Herbert Gray, A. I. A., landscape architect and town planner, has opened offices at 307 Prospect street, New Haven, Conn., and 1402 Broadway, New York. He desires catalogues at the New Haven office. Mr. Gray retired from the firm of Gray & Wischmeyer of Louisville, Ky., in 1917 to enter the Engineer Corps of the army. He served as Major in various capacities in the United States and France and was commandant of the Army School of Fine Arts at Bellevue, Seine et Oise and head of the city planning department of the same school.

Walter Kerr Rainsford, son of the Rev. Dr. Rainsford, formerly of St. George's Church, New York, has recently been appointed professor of architecture and acting head of the School of Architecture at the Carnegie Institute of Technology. Prof. Rainsford is a graduate of the Groton School and took an A. B. (magna cum laude) degree from Harvard in 1904. He was awarded a John Harvard scholarship, and in 1912 the French Government conferred upon him a diploma from the Ecole des Beaux Arts, Paris. During the war he was a Captain in the infantry, and was wounded twice. Previous to the war he was engaged in architectural practice in New York.

Financial and Commercial Digest

As Affecting the Practice of Architecture

Building Costs Must Be Reduced by More Efficient Methods

If the cost of labor, one of the most important items of expenditure in construction work, can be reduced or economized by skillful management, improved methods and better working conditions, it is believed that the ultimate cost of building will be correspondingly reduced. Architects and builders accordingly expressed the opinion this week that there soon must come a breaking away from many of the existing stereotyped methods of operation. It was generally felt that economies can be made in many directions if the workman is persuaded to adopt a different attitude toward his work.

That labor has its duties and responsibilities as well as its privileges seems to be forgotten by many trade union leaders. There appears to be no effort by workmen themselves to secure efficiency and increased output. Labor must be educated to realize the duty it owes to itself and the community. It should cultivate an ambition to give fair and honest work in return for good wages, short hours and better conditions of living.

The present attitude of labor, is, admittedly, one of the most menacing of the many serious difficulties which must be combated. So much is at stake, and so great is the need for greater productivity that no question exists that it is more momentous than any other problem of the present time.

In the field of construction two possible solutions of the difficulty are occupying the attention of the architectural and building profession. One is substitution in building materials and the other, closely allied, is the advancement of new departments in the execution of building operations. It is not surprising in view of the calamitous dearth of build-commodities that architects and builders are earnesly seeking all trustworthy information concerning the substitutes for heretofore considered essential materials—both those that are of established reputation and those that have been newly introduced—which inventive genius has produced.

At the same time a strong effort is being manifested to break away from construction methods which have been in general use for the past fifty years and put any improvements into execution that will make for efficiency in the present great rush of reconstruction. While it is true that in the field of engineering practice many economies have been effected, it is certain that in ordinary operations of building there has been little disposition to break away from stereotyped methods.

Charles M. Schwab, who began his career as an iron worker, is a staunch advocate of economy and industrial efficiency. The New York Sun quotes Mr. Schwab on increased productivity, as follows:

"The basis of the so-called German efficiency is founded on an honest day's work for an honest day's pay, and when that theory is applied here then will the high cost of living disappear, for there is but one way to secure that—economy and industrial efficiency." Strong words and sound gospel—true Americanism, comments the Sun.

Concentrated working effort and efficiency must be the means of combating the destructive policy of increased pay and shorter working hours. The present estimated reduced labor output of 20 per cent, due to exceptional war influences, must be still further reduced if this country is to maintain its industrial position. It must be assumed that the wage increase in the building trade is permanent; therefore any reduction in labor values in building work must be obtained through an increased efficiency of the workmen themselves, and the adoption of all labor-saving machinery and improved plant organization it is possible to secure.

If industries are to be tied up by strikes, such as now affect the steel industry, what is going to happen to the men who are engaged in building, the carpenters, the masons and the many others? The builders will not be able to get supplies, so their work will be useless. They will simply be out of a job. If no builder will build, how can people complaining of the need of proper housing have their needs satisfied when conditions have been created

that make it impossible for capital to enter into building operations? Will capital take a chance, not knowing where it stands for twenty-four hours, because of the present situation in the field of labor, or will it wait until conditions are again normal?

Organized labor must take immediate steps to remedy its internal disarrangement before it can possibly hope to make further progress anywhere. The unions must cease their flagrant disregard of agreements and abide by arbitration to which by their vote they agreed to submit their grievances and demands. Proof of the good faith of the labor unions must be firmly re-established before it will be worth while to discuss any other phase of the industrial questions now presented.

If present conditions are permitted to continue, labor's program will soon be stopped, not from the efforts of its opponents, but from the internal discord in its own organization. Labor, it may be judged from its present attitude, will not accept responsibility for anything. It wants all the profits and benefits but will not share in the losses that may result. The whole principle of collective bargaining rests upon collective responsibility and collective good faith. In many of the present strikes labor has reduced its contracts to scraps of paper and by such methods has threatened the annihilation of everything it has achieved.

No temporary peace between capital and labor should be considered. The subject is too big. Conditions must be brought about that will enable us to use the vast opportunities in domestic and foreign commerce that are ours, otherwise the present industrial unrest cannot be effectively settled.

An Architect Abroad With Hoover's Legion

(*Continued from page 543*)

good and fly horizontally), but over 3,000 feet above the starting point.

As from an airplane men and their cities certainly seem to be the tiniest of spots on our dear old planet. Montenegro at present is certainly not a choice place to live in, the Serbian troops occupying the country have about all they can do to control the comitaches who invest the roads between the towns and the hills, and if there is anything about architectural interest to be found there, I surely missed it. There is in Cetinje, in a building constructed especially for the purpose, a tremendous relief map of Montenegro; unfortunately, the building was locked while we were there, but the map could be seen through the windows. It is about one hundred feet square and shows every road, and as far as I could guess, every house in Montenegro. The rough, slightly wooded hills of Montenegro are not very inviting and the country has certainly been well named. We were glad enough to have finished our business and "shove off" for more pleasant lands at the shore of the sea. The American Red Cross Unions, which are in Montenegro, have my highest admiration.

Department of Architectural Engineering

The Behavior of Reinforced Concrete Columns Under Fire Test—Part I.

By Walter A. Hull*

THE fire-resistive qualities of concrete columns have now been under investigation by the Pittsburgh laboratories of the U. S. Bureau of Standards for approximately two years. During this time a large number of tests on full sized columns have been conducted and sufficient data accumulated to permit the drawing of some rather definite conclusions. These tests are still in progress, and formed the subject of my paper entitled "Fire Tests of Concrete Columns" presented at the 1918 convention of the American Concrete Institute, and also a paper bearing the same title in the nature of a progress report, presented by me at the recent 1919 convention of the Institute, which convention was reported in the July 9th issue of THE AMERICAN ARCHITECT.

The need for more definite knowledge than we now have as to the potential ability of different kinds of concrete in different types of construction, to withstand the attack of a severe fire, is perhaps not so generally recognized as it should be. Our concrete structures are built so massively and with such liberal factors of safety, that they usually come through fires of even considerable severity not only without failure but frequently without evidence of any serious injury. Yet, on the other hand, there is an occasional instance of serious structural damage, with great financial loss, in reinforced concrete buildings by fires of rather short duration and only moderate severity. There is no generally accepted explanation for these exceptional cases in which concrete has not stood up to its reputation and until a satisfactory understanding of the causes of these mysterious failures can be established, concrete structures in general cannot be free from the effect, in the public mind, of the uncertainty engendered by these isolated collapses.

Concrete has been, and is, in this country at least, passing through those pioneer stages in which uncertainties as to the quality of the finished product and also uncertainties in design, are allowed for by rather extravagant factors of safety. This condition is now passing; our knowledge of what can be depended on from a given mixture of concrete, from given materials, is fairly definite and it may be anticipated that greater reliability will result, in design, in the use of higher working stresses for concrete, with a consequent cutting down of the masses in concrete structures. We cannot afford to use unnecessary tonnages of materials in the construction of our buildings and one of the absolute essentials to safety in the progress of more effective use of material is intelligent regard for the fire hazard.

The present investigation by the Bureau of Standards was designed secure, with a minimum number of tests, of full size columns, some definite information as to the effect of the kind of aggregate, the kind of reinforcement and the form of the column, on the behavior of concrete columns under fire, including such data as the temperatures attained in the reinforcement and in the interior of the column, as well as the strength of the column while the highest temperatures existed.

Nearly all of the columns were made 18 in. in diameter, if round, or 16 in. square. Round columns, 12 in. in diameter, were made from one aggregate, with one type of reinforcement. In all columns having reinforcement, the latter was placed so as to leave a thickness of 1½ in. of concrete outside the steel. The effective diameter in spirally reinforced columns was taken as the horizontal distance between centers of the hooping. Vertical rods in columns having only vertical reinforcement, were placed at the same distance from

*This article is based on two papers by Mr. Hull, presented before the American Concrete Institute. Part I deals with the data contained in the first paper, and Part II with that in the second.

*U. S. Bureau of Standards, Pittsburgh, Pa.

the outside of the column as the vertical rods in hooped columns, the effective diameter being assumed to be the same as that for spirally reinforced columns of the same size. In the square columns, the vertical rods were placed at the same distance from the surface of the concrete as in the round ones and the effective area was taken as that portion within a square with its sides located 5/32 in. beyond the outside of the rods to correspond with the criterion followed in figuring the effective area of the spirally reinforced round columns. All columns were made 8 ft. 9 in. long.

The gravel used was the washed river gravel commonly used in the Pittsburgh district for making reinforced concrete. This material is fairly well graded but is somewhat coarse, the largest pebbles being large enough to remain on a 1½ in. screen. In order to remove a variable quantity of fine material, the dry gravel was passed over a screen which passed sizes approximating ¼ in. and smaller.

The limestone aggregate was from quarries at West Winfield, Butler County, Pennsylvania. It is a high calcium limestone. As furnished from the quarries, it was fairly well graded, the sizes ranging up to about ¾ in. In all the columns, the Pittsburgh river sand was used. One proportion, 1 : 2 : 4, was maintained throughout the series. The age of columns ranged, at the time of testing, from six to nine months.

The test apparatus consisted essentially of a gas-fired furnace which is provided with a loading equipment so that a load can be kept on the column during test and that the column can be tested for strength, while still hot, if desired. A 600,000 lb. load can be applied without difficulty.

Temperature is measured, both in the furnace and in the interior of the column, by means of iron-constantan thermocouples and a Leeds and Northrup potentiometer indicator. The couples in the column are placed before the column is cast, a special device being used to hold the couples in position during the placing of the concrete.

In all tests, the working load of the column is kept on the column during the fire test. In most of the tests the load has been increased, at the finish of the fire test, up to the ultimate strength of the column or to the capacity of the test apparatus. If the column withstands the 600,000 lb. load, it is permitted to cool, transferred to the 10,000,000 lb. machine and tested in that.

The firing of the furnace is regulated, as closely as possible, to conformance with the tentative standard fire-test curve, which is shown in Figs. 1 and 2.

That portion of the test data which is calculated to give, in condensed form, the characteristic performance of the different kinds of columns, has been arranged in tabular form, as presented in the following Tables I to V:

TABLE I

18 in. cylindrical columns.
Thickness of concrete outside the steel, 1½ in.
Reinforcement: 2 per cent vertical, 8 round rods, ¾ in. diam.
1 per cent spiral, 3-16 in. diam., 2 in. pitch, 2 spacers.
Effective area concrete, 168.7 sq. in.
Area vertical steel, 3.53 sq. in.
Effective area column, 172.2 sq. in.
Working load, 141,500 lb.

	Column Number	Maximum Load, Lb.		Maximum Stress, Lb. per Sq. In.	Maximum Temperature at End of 4-Hour Fire Test, Deg. C.		
		Without Fire Test	At End Fire Test		In Steel	Midway Between Steel and Center	At Center of Column
Gravel concrete	1	.....	*	.....	950	410	240
	2	.....	*	.....	1,050	460	290
	3	.....	197,000	1,145	945	355	210
	5	1,090,000	.....	6,340	.....	.....	.....
Limestone-concrete	17	.....	*	.....	520	240	120
	18	.....	*	.....	560	180	100
	20	1,187,000	.....	6,890	.....	.....	.....

*Column No. 1 failed, under working load, at end of 3 hr. 45 min.
Column No. 2 failed, under working load, at end of 4 hr. 15 min.
Column No. 17 loaded, at end of 4 hr. fire test, to 600,000 lb. without failure. Tested later, cold, in large testing machine. Maximum load, 820,000 lb.
Column No. 18 tested in the same way as No. 17. Maximum load, 916,000 lb.

TABLE II

18 in. cylindrical columns.
Thickness of concrete outside the steel, 1½ in.
Reinforcement: 2 per cent vertical, 8 round rods, ¾ in. diam.
Ties, ¼ in. diam., 12 in. centers.
Effective area concrete, 168.7 sq. in.
Area steel, 3.53 sq. in.
Effective area column, 172.2 sq. in.
Working load, 99,750 lb.

	Column Number	Maximum Load, Lb.		Maximum Stress, Lb. per Sq. In.	Maximum Temperature at End of 4-Hour Fire Test, Deg. C.		
		Without Fire Test	At End of 4-Hr. Fire Test		In Steel	Midway Between Steel and Center	At Center of Column
Gravel concrete	7	.....	*	.....	1,010	310	210
	8	.....	235,000	1,365	630	270	130
	10	803,000	.....	4,660	.....	.....	.....
Limestone-concrete	21	.....	370,000	2,150	580	240	100
	22	.....	375,000	2,180	580	230	100
	24	739,000	.....	4,290	.....	.....	.....

*Column No. 7, after 5-hour fire test was loaded to failure. Maximum load, 185,000 lb.

TABLE III

18 in. cylindrical columns.
Thickness of concrete considered as protective material, 1½ in.
Reinforcement, none.
Effective area, 180 sq. in.
Working load, 81,000 lb.

	Column Number	Maximum Load, Lb.		Maximum Stress, Lb. per Sq. In.	Maximum Temperature at End of 4-Hour Fire Test, Deg. C.		
		Without Fire Test	At End of 4-Hr. Fire Test		2¼ In. from Surface	5⅝ In. from Surface	At Center of Column
Gravel.....	12	.....	130,000	835	1,070	450	205
Concrete.....	15	657,000	.....	3,650	.....	.....	.....

TABLE IV

16 in. square columns.
Thickness of concrete outside the steel, 1½ in.
Reinforcement: 2 per cent vertical, 4 round rods, 1 in. diam.
Ties, ¼ in. diam., 12 in. centers.
Effective area concrete, 156 sq. in.
Area steel, 3.14 sq. in.
Effective area column, 159.14 sq. in.
Area steel, 3.14 sq. in.
Working load, 92,000 lb.

	Column Number	Maximum Load, Lb.		Maximum Stress, Lb. per Sq. In.	Maximum Temperature at End of 4-Hr. Fire Test, Deg. C.	
		Without Fire Test	At End of 4-Hr. Fire Test		In Steel	At Center of Column
Gravel concrete	25	.....	160,000	1,005	775	160
	26	.....	132,000	830	995	165
Limestone concrete	29	.....	375,000	2,360	660	100
	30	.....	385,000	2,420	630	100
	32	810,000	.....	5,090	.....	.....

TABLE V

12 in. cylindrical column.
Thickness of concrete outside the steel, 1½ in.
Reinforcement: 2 per cent vertical, 4 round rods, ⅝ in. diam.
1 per cent spiral, ¼ in. diam., 2⅛ in. pitch, 2 spacers.
Effective area concrete, 60.87 sq. in.
Area vertical steel, 1.23 sq. in.
Effective area column, 62.1 sq. in.
Working load, 50,850 lb.

	Column Number	Maximum Load at End of 4-Hour Fire Test	Maximum Stress, Lb. per Sq. In.	Maximum Temperature at End of 4-Hour Fire Test, Deg. C.		
				In Steel	Midway Between Steel and Center	At Center of Column
Gravel concrete..	33	71,000	1,145	690	560	480

It is seen, from an inspection of the tables, that the poorest showing was made by those gravel concrete columns which had both vertical and spiral reinforcement. On the other hand the best

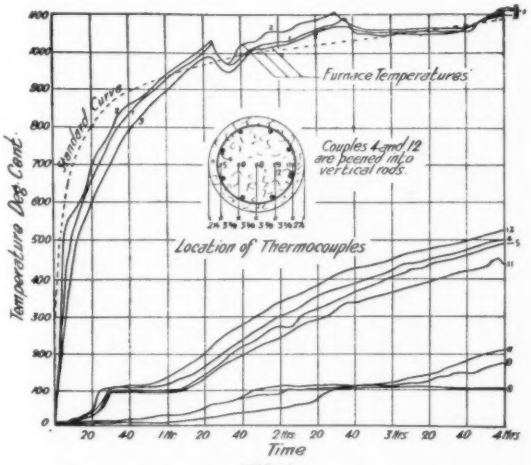


FIG. 2
Col. 17: 18-in. Limestone Concrete Column With Spiral and Vertical Reinforcement

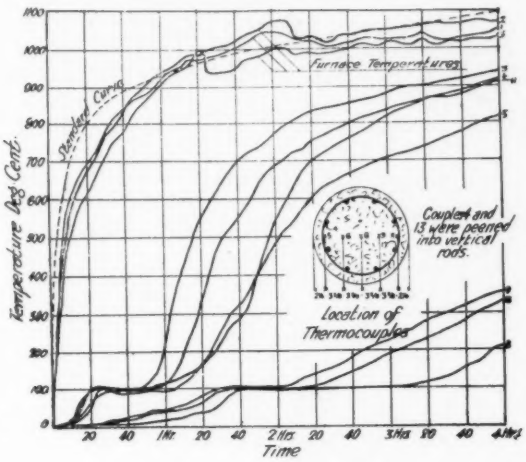


FIG. 1
Col. 3: 18-in. Gravel Concrete Column With Spiral and Vertical Reinforcement

showing was made by columns of the same type but with the limestone aggregate. The reason for this rather remarkable contrast between different columns of the same size and having the same kind of reinforcement, is found in the physical behavior of the different concretes, under fire. With slight variations, the observations made on the gravel concrete columns, Nos. 1, 2 and 3, were as follows: after approximately 30 minutes of firing, cracks began to appear in the surface of the concrete. The nature of the cracking was similar to that which is observed in columns of this type when tested cold, just before the final failure. The appearance of the column, at this stage of the fire test, was that of a column that was failing or about to to fail. In reality, it appears to have been actual failure, but failure only of the concrete covering, outside the spiral. After this action started its process was very rapid: cracks lengthened until they intersected other cracks, thus dividing the outer concrete up into large pieces of slabs, which gradually separated from the rest of the column, so that after approximately one hour of firing, slabs would begin to fall, exposing the spiral reinforcement and the load bearing portion of the concrete to the direct heat of the furnace.

The falling of these broken portions of the outer concrete was a rather slow, gradual process, individual slabs hanging from the top or standing from the bottom of the column for some time after they had separated to such an extent that the end near the middle of the column took out some inches from the solid part of the column. However, after one hour of testing, the load bearing portion of the column would be partially exposed and by the end

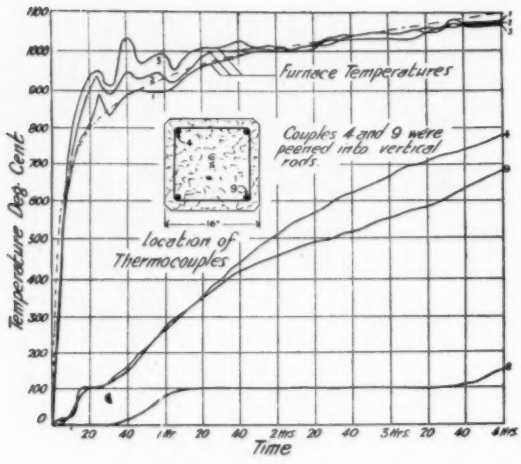


FIG. 6
Col. 25: 16-in. Square Gravel Concrete Column With Vertical Reinforcement

of the second hour a very large portion of the length of the load bearing portion of the column would be completely exposed, so that after the first hour the column proper was only partially protected and after the second hour it had practically no protection at all.

The progress of the temperatures within the columns under these conditions, is seen in Fig. 1. It is evident that at the end of the second hour of firing, the lowest temperature recorded at the depth of the steel was 480°C. and the highest was 770°C. It is known that steel in tension loses 50 per cent of its strength when heated to between 500°C. and 600°C. and it is reasonable to assume that the same is true for steel in compression. It appears, therefore, that in this column, which made the best showing, in every way, of the three columns of this type which were submitted to fire tests, the strength of the reinforcement must have been reduced 50 per cent or more in the first two hours of firing, and that there must have been loss of strength in the load bearing portion of the concrete as well.

The comparison with the temperature shown in Fig. 2, for column 17, is significant. In this spirally and vertically reinforced limestone concrete column, the temperatures recorded at the depth of the steel at the end of two hours, ranged from 240° to 340°C. The difference is attributable for the most part, to the fact that in the limestone columns, even those with spiral reinforcement, there was very little cracking during the fire tests, the protective concrete staying in place and shielding the load Square columns, vertically reinforced, spalled do. If we compare the temperature condition of these two columns at the end of the four-hour fire test, it is found that in col. 3, the temperatures recorded at the depth of the steel ranged from 820° to 940°C. and those in col. 17, at the same depth, were between 440° and 530°C. Temperatures at a depth midway between the steel and the center of the column show the same tendency for these two columns, though at this depthe the contrasts are naturally somewhat less marked. The effect, however, is seen even at the center of the columns, the temperature at the center in col. 17 being approximately 100°C. as compared with 210° at the center of col. 35. It is evident from the results of the compression tests made after the four-hour fire tests, that in col. 3, not only the steel but the load bearing concrete as well had lost strength very seriously, for the results of the test of col. 15 shown in Table III indicate that the load bearing concrete in col. 3, if uninjured, should have been good for approximately 450,000 lb., without any reinforcement.

Gravel Concrete Columns.—In all gravel columns of this series, there was a marked tendency for the outer concrete to break up early in the fire test, and for the resulting slabs and fragments to separate and fall off, exposing the load bearing portion of the column. The effect of this process, in the most extreme cases, is to strip the load bearing column of its insulation, early in the fire test, with the result that comparatively high temperatures are reached in the steel and in the interior of the column. This spalling is most active in the columns having spiral reinforcement. Round columns with vertical reinforcement. Round columns with vertical reinforcement, with ties every 12 in., suffered much less from spalling than those with spiral reinforcements.

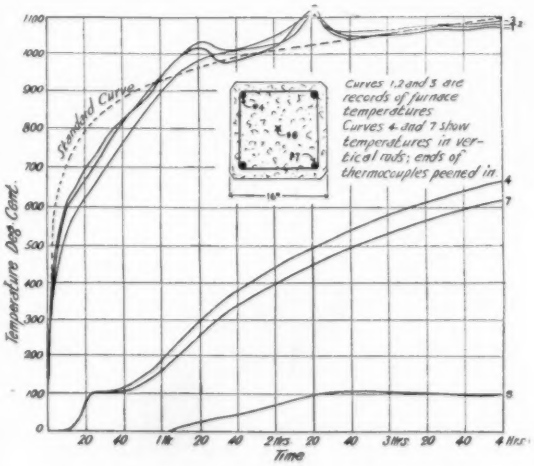


FIG. 7
Col. 29: 16-in. Square Limestone Concrete Column With Vertical Reinforcement

Square columns, vertically reinforced, spalled badly. A round column with no reinforcement showed an intermediate behavior between that of the round columns with spiral and those without. Strength tests at the end of the 4-in. fire tests showed that gravel concrete columns with spiral reinforcement had retained from less than 15 to approximately 18 per cent of the strength of the duplicate column tested without exposure to heat. A round column with vertical rods and no hooping had retained approximately 30 per cent of the strength, square columns from 16 to 20 per cent and a plain column approximately 23 per cent.

These unfavorable results with a gravel concrete are similar, in a general way, to those which have been observed, at various times, in laboratory heat tests and in fires in concrete buildings.

The expansion behavior of quality marks it as a material which would be likely to cause trouble in concretes in which it formed a large part of the aggregate, which is the case in most of our gravels.

Col. 2	Col. 18	Col. 8	Col. 21	Col. 25	Col. 29
Gravel concrete failed in 4 hr. 15 min. Concrete came off early in test.	Limestone concrete. After 600,000 lb. at end of 4 hr. fire test.	Gravel concrete. Round.	Limestone concrete. Round.	Gravel concrete. Square.	Limestone concrete. Square.

FIG. 5—EFFECT OF FIRE IN LOAD TESTS ON DIFFERENT TYPES OF REINFORCED CONCRETE COLUMNS

There is strong evidence than the peculiar behavior of the gravel concrete in our column tests is due to expansion; yet the Pittsburgh gravel is not made up of pure quartz pebbles. It contains a few quartz pebbles along with a much larger proportion of pebbles of sandstone and of other harder rock, all appearing to be high in quartz. Inasmuch as most of our gravels have an exceedingly high quartz content, it would seem, from the

information available at present, that any gravel aggregate should be investigated before being used, unprotected, in important work requiring fire resistive properties in the concrete.

Inasmuch as gravel concrete is almost an economic necessity in certain localities, a further series of tests were planned, and have been in progress for some time, providing various types of outer shell protection to the gravel concrete interior. The result of these tests are encouraging.

The behavior of the limestone concrete under the action of high temperatures is interesting and extremely important. In many localities a prejudice exists against the use of a limestone aggregate. The tests data is favorable to this material, and in the light of the results given in the tables and curves, the architectural profession should lend its efforts to extend the use of limestone aggregate in localities in which it is available.

In Part II will be described a further series of tests conducted by the Bureau of Standard, based on the 1919 report, and the conclusion so far arrived at, as well as the recommendations of the American Concrete Institute Committee on Fireproofing.

(To Be Continued.)

Swiss Method of Letting Contracts Advocated by Member of Associated General Contractors

IN these perturbed times when we seem floundering about in an effort to extricate ourselves from the many individual and social entanglements which the Great War has left in its wake, any hopeful suggestion is eagerly snatched up and examined to determine whether it possesses a real or only apparent merit.

In this connection it is interesting to note that Mr. O. P. Cherdon, president of the Lynch-Cannon Engineering Co., of Salt Lake City, in a statement published in a recent news-letter of the Associated General Contractors of America, advocates the apotion of the Swiss method of awarding contracts. He explains this system as follows:

In Switzerland, contractors of standing and proved reliability are invited to compete for public work, and before a contractor is invited, he has to have an established reputation for fairness in his dealings and competency in his profession. No bidders will be admitted except upon invitation by the public board.

After such a public board has received the bids, it will not let the work to the lowest bidder nor to the highest bidder, but it will let it to the bidder who is closest to the average bid received. For instance, suppose that on a project involving the expenditure of $200,000 there are received by the public board in Switzerland five bids. The bids range as follows:

A	$ 196,000.00
B	218,000.00
C	212,500.00
D	197,368.00
E	217,950.00
Total sum of all bids	$1,041,818.00
Average bid	208,363.60

In this case Bidder "C" would get the business. If a contractor should try to throw the average bid up or down by juggling, his bid would be rejected, and if he cannot prove that he made an honest mistake he would forfeit his right to bid on future public work for a certain period of time. For instance, should bidder "A" bid $120,000.00 instead of $196,000.00, and should bidder "B" bid $310,000.00 instead of $218,000.00, those two bids would be rejected by the board, and those two bidders would not be allowed to bid for a certain length of time on any work. Their bids would not be considered in the general average on this particular set of bids.

If the Swiss method of letting work were generally adopted, it would, in my opinion, help very much toward the elevation of the contracting profession.

It would seem that this method has several points in its favor. It would tend to eliminate cut-throat bidding where the lowest contractor figures at taking the job for cost and skimping enough to provide his "profits." It would also tend towards honest estimating.

This method, considered in connection with the preparation of quantity surveys on each job, provided by the architect or engineer on the project, would keep competition alive and be fair to both owners and contractors, since the average price based on a careful estimate of materials, should be nearer correct than either of the extremes, and should provide a sufficient profit to enable the contractor to do good work.

New Series of Tests to Be Made on Steel Columns

By American Railway Engineering Association.

PROBABLY no part of a structure is less capable of correct theoretical analysis than the column. No part of the structure is of greater importance. The fact that our building—the columns in the highest of which support enormous loads—remain in place is evidence that the present methods of computing the strength of columns are safe. Such methods are based on tests made during the course of many years. The query has many times been raised: Can we apply the results of these many tests which were not directly related, often made on small specimens of limited sections, to large columns of totally different sections? Are certain sections more economical than others? Do present methods provide a greater factor of safety in short than in long columns or vice versa? Are columns uneconomically designed?

Comparatively recent attempts have been made to answer these and other questions. A great and costly series of tests was carried out at the Bureau of Standards laboratory for a committee of the American Society of Civil Engineers a few years ago. The report of this committee and their conclusions were published, and undoubtedly there is much valuable information contained in the vast number of test sheets, recording the results of this series. Among many engineers the report of the test committee was not accepted as properly interpreting the results of the tests, and largely for that reason, and also due to the interruption caused by the war, no concrete changes in column design have been made as a result of this latest series of tests. Due to the large amount of money expended in making these tests, it is hoped that the test sheets will be further and carefully analyzed with a view to bringing out useful data that can be applied to building design in order that it may be made both safer and more economical, for the ultimate benefit of all.

The subject is a live one, and therefore of considerable interest is the contemplated series of steel column tests, announcement of which was recently made by the American Railway Engineering Association. These tests, it is expected, will be commenced at an early date.

It is hoped that this series of tests will be conducted with a view of obtaining practical results, and that it will be more fruitful in this respect than the series already referred to. Unlike this former series, however, in which column ends were milled square and the columns centrally loaded, the proposed tests will also deal with the important subject of column detail. After all, efficient details are essential to proper column design. It is rarely that building columns are centrally loaded, and often the eccentricity of the connections adds considerably to the direct stresses.

The results of these proposed tests will be awaited with interest, and the committee having this work in charge would do well to carefully examine the record of the American Society of Civil Engineers' column tests, in order to profit thereby and increase the possibilities of bringing out really valuable data capable of interpretation into practical results.

Many engineers hold the view that comprehensive tests will bring to light data on which to base a new column formula, more logical and economical than any of those now in general use. If these tests lead to this end they will be well worth while. In any case they cannot fail to be enlightening on this subject.

The Des Moines Labor Agreement

BUILDING operations of large magnitude have been held up by three prime causes, i. e., doubt as to the permamency of the present high prices; a shortage of skilled and unskilled labor, and the unrest in the field of labor as evidenced by recent strikes. Millions of dollars worth of construction work in both New York and Chicago, America's two largest cities, was recently tied up for many weeks due to a combination of strikes and lockouts.

Before building operations can even approximate in magnitude the amount necessary to bring housing conditions back to normal within a limited time, these hindrances must be removed. The first is gradually being discounted as the market holds firm and even shows a silght upward trend. The second requires a reapportioning of labor, much of which flocked to industrial centers to engage in the more profitable forms of war work. This condition will gradually right itself. Immigration laws which may be enacted will have a direct bearing on this phase of the question, as there is a great dearth of unskilled labor. The third item is showing signs of being removed, as new wage scale agreements are being entered into. Both New York and Chicago have adopted wage scales which it is hoped will hold during 1920. As these scales are much higher than those superseded, which it must be admitted were too low to meet the workingman's needs under the pretest high cost of living, labor in other cities where the lower scales are in force, demands like increases and threatens to strike unless these are granted.

Some months ago the city of Des Moines, Iowa, passed through a period of labor turmoil, now set-

tled, and the method by which a settlement was arrived at can be studied with profit.

Mr. Frederick W. Weitz, a member of the joint board which decided the dispute states that during the six weeks of "shut down" the labor organizations had aired their demands through the newspapers, and the newspapers, of course, had also obtained statements from the employers and from representative citizens of Des Moines. He goes on to say:

It was at this stage that the writer insisted on a program of arbitration, with three men representing the public as a Board of Umpires. None of the three men were to be affiliated in any way with labor organizations nor were they to be connected with the contracting business. Public officials were also barred. Fortunately, there was little difficulty in the selection of the three umpires, who were also more or less interested in building work and, therefore, familiar with conditions in the industry. The desire of the Builders' Association was to have the Umpire Board truly representative of the interests of the ordinary citizen, and, in addition, to select men who were interested in building construction. It is important that the umpires be men of this type rather than of the class which is not identified with the upbuilding of general welfare of the city.

I take pleasure in saying the arrangement was ideal. On one side of the table sat four men representing trade organizations. One of them was a bricklayer; one represented the plumbers and the steam fitters; one represented the painters, and the fourth man was a carpenter. On the opposite side of the table sat four contractors representing the builders. At one end of the table sat the chairman of the Board of Umpires, who filled the position with all that the word implies. At the opposite end sat the other two members of the Board.

I should further explain that the Umpire Board represented one vote in case of a dispute, it being assumed in case of dispute that there would be four votes against four votes and you will understand that the Chairman of the Umpire Board would cast the deciding vote. In case there was a matter in which he would not care to cast the vote without consulting the other two members, it was expected that the three would retire to an adjoining room before casting the deciding vote. It is interesting to note, however, that during all of our negotiations it was never at any time necessary to make use of the Umpire Board in order to reach a decision. Although we had many strenuous days, in fact worked up to midnight at times, we decided every point without taking the vote.

At times our meetings became very strenuous, especially, for instance, when we would invite in a delegation of electricians to meet their employers. We always used the system of having each side talk freely, feeling that this method was good for the soul, and that in this way we would make much better headway, and I can say that it worked admirably. In one case we locked the doors, forcing a decision before adjournment.

The way in which common labor was handled is especially important, in my estimation. At no time would we allow the Common Labor Organization to appear before us. In face, we forced the Trades Organization Committee to represent the common laborers, thus holding them at least morally responsible for all the acts of the common laborers. Assuming that it may finally be necessary to recognize common laborers, much will be gained by having the Building Trades Council vouch for their integrity.

One of the principal reasons for insisting on the Umpire Board of citizens is that the demands made by trade organizations will be made known to the citizens and the public will therefore get a better understanding of trade organizations than they would in any other way. The trade organizations, in our case at least, backed down considerably on some demands which they had formerly insisted on.

The agreement finally reached provides for the creation of a permanent arbitration board, which, with the aid of an umpire, is empowered to settle all disputes with the exception of jurisdictional matters, which shall be placed before the recently organized National Board of Jurisdictional Awards, if necessary. Sections 2, 3 and 8 of the agreement are printed herewith:

"Both parties hereto agree that there shall be no strikes, lockout nor cessation of work on account of labor troubles without the sanction of the Joint Arbitration Board, and they will by all lawful means compel their members to comply with such arbitration agreement and work rules as are jointly agreed upon and adopted. Where a member or members affiliated with either of the parties to this agreement refuse to follow the directions of the Joint Arbitration Board, the offending member or members shall be suspended from the association, council or union as the case may be, forthwith, and not reinstated until so decided by the Joint Arbitration Board.

"Should any member of the Builders' Association of Des Moines refuse or fail to comply within the specified time with the findings of the Joint Arbitration Board, the party of the Second Part shall refuse to furnish men from any craft to work on any building under construction by said delinquent contractor. In the event of any craft or member of the Combined Building Trades Council of Des Moines failing to comply within the time specified with the decision of the Joint Arbitration Board, all members, party of the First Part, shall refuse to employ any member or craft refusing and shall have the right to employ any men required to complete the work of the craft involved.

"Should the Joint Arbitration Board be unable to reach an agreement on any matter placed before them for consideration, they shall elect an umpire who shall in no wise be affiliated with the trade under consideration; it is agreed, however, on all matters of jurisdictional dispute that in case the Joint Arbitration Board cannot agree the matter shall be referred to the National Board of Jurisdictional Awards, Washington, D. C., whose decision shall be final. It is agreed that when the services of an umpire are made necessary the expense, if any, shall be borne equally by both parties."