Architecture ❧ J S. Barney

IN contemplating the future architecture of America one is at once confronted with the question: have we a national style of architecture, and if so along what lines is it developing? I would say that we will have a distinct style because we have distinctive conditions, but we have not yet developed a genius with the power to express these conditions with sufficient truth to furnish us with an example.

Conditions create a style. Genius furnishes examples. Our advance to a pure, true and distinctive style in architecture is as certain and irresistible as is the march to our natural position in the front rank of the nations of the earth. Architecture is much affected by fashion and fad, but we must not forget that the conditions of life, ambitions and religion of a people determine the style of their architecture, and not the whims of misguided imitators. We are great, powerful

and rich, full of youth and vigor, and it is but natural to expect that we will develop an architecture upon which we will impress these characteristics.

America at this time, untrammeled by the traditions of the past, is in an extremely susceptible condition. Wealth acquired so rapidly is held by some who are more easily led along the lines of vulgar display than that of true art. I have such confidence, however, in the recuperative power of youth that, though we may through the influence of the modern French school be dragged into a position as ridiculous as it is false, we will rise superior, and will in time present to the world a pure American style.

At present there is no distinct style, but apparently a tendency to such. There is a certain contempt of existing conditions which conditions are just as honest and sincere and as capable of producing a distinctive style as those that governed the architecture of the past.

Although I feel that we are to-day further away from a national style than we have been at any period in our history, I am confident that we will develop one, but as to what this style will be it is impossible to predict. We can only study the architecture of the past, and by deduction form an opinion.

The first great movement that was ever made in this country looking to the development of a national style was due to the great genius of one man, H. H. Richardson. He has been severely criticised for starting this development with the forms of the early christian architect, and apparently disregarding all of the works which followed them up to the time of his life; but he seems to have felt that the bold, free and ponderous Byzantine and Romanesque forms were the best foundations for the architecture of a young and powerful nation. It was along these lines alone that he worked through his brilliant but short career. He was looked up to, honored and imitated. Few architects in this country failed to gather inspirations from him, and it is laughable to see the grotesque attempts made by some of his contemporaries who are now loudest in [th]eir criticism of him. He is sometimes r[e]ferred to as an erratic genius, who, li[ke] a comet shooting across the firmamen[t of] art, disappears in the depth of the h[orizo]n, and leaves nothing but the reflec[tion] of its tail. Mr. Richardson was [univer]sally copied throughout this cour[try; t]he forms which he handled with su[ch a m]aster hand were used with such abso[lute] lack of appreciation by his imitators, th[at] not only was the country filled with the[s]e architectural monstrosities, but discr[e]dit was thrown upon his work. I do n[o]t pretend to say that Mr. Richardson established a national style, nor do I hold that he had selected the best foundatio[n] stone for such a style, but I do believ[e] that had he been immediately followe[d b]y a genius equal to himself, our archit[ec]tural offices at this time would not be [em]balming establishments for the handli[ng] of the corpses of Europe, and our [ar]chitectural inspirations post-mortems. [N]or would our people be learning to love [t]he vulgar forms of the most degenerat[e p]eriod of French art.

After Mr. Richa[r]dson's death some great mind conceived [th]e idea that to establish an American [s]tyle we must study the architecture of o[ur] own country, and the farmhouses of V[ir]ginia suddenly found themselves transf[o]rmed into gold mines of information for th[e] painstaking archaeologist. The gate [p]osts, parlors and pumps were studied, m[e]asured and given a position in the histo[r]y of the architecture of the world se[c]ond only to the Parthenon of Athens. It is with pleasure that I mark the end of his "Jeffersonian" period, and rejoice in th[e] fact that Thomas Jefferson has been ro[bb]ed of his great reputation as an archi[te]ct and is forced to hold his position in t[he] history of this country solely as a st[a]tesman and the writer of the Declarat[io]n of Independence.

In order to form some [i]dea of the architectural monuments w[h]ich will be the striking landmarks in o[ur] country in the coming century it will [b]e necessary to decide what buildings a[re] necessary and are inseparably associate[d] with our lives. We may safely predict [t]hat we will not have pyramids of Egyp[t,] Greek temples or feudal castles, as th[ey] cannot in the wildest dreams of our i[ma]gination take a natural position in [ou]r lives. The line upon which, in my [hu]mble opinion, the architecture of this [co]untry will be developed will be:

First—Our great public [b]uildings.

Second—Great commerci[al] buildings.

Third—Ecclesiastical gr[ou]ps of buildings.

Fourth—Great public lib[ra]ries.

Our people take pride [a]nd interest in their public buildings. [T]his pride and interest will be followed by an appreciation of the good and a condemnation of the bad. Great co[m]mercial buildings will be much larger a[n]d higher than at present. I will not attempt to go into a scientific treatise upon t[h]e preservation of steel, nor will I predic[t] the future of the now existing steel b[u]ildings, but I believe that the present form of construction has come to st[a]y, and should it be found at the end [o]f the coming century that disintegrati[o]n had so far progressed that it was n[e]cessary to remove all of the buildings that are now standing in New York, it would not deter the architect of [t]he day from building such again, but t[h]e ingenuity of an ingenious nation woul[d] be turned to the better protecting of the steel skeleton.

The high office building is a necessity, and is an exact outcome of the existing conditions, and it is a problem that must be and will be solved. One hears with sorrow for the speaker the statement made by architects that the high office building of America is not architecture, and that no architect with true artistic feeling or with any respect for his profession past and present would accept such a commission. Is this on account of the fear of the criticism of the high-bound architectural critic of the Old World? Or does he fear to undertake a problem entirely new, and for which he has no precedent? Or is it because the problem has not yet been satisfactorily solved by the student of the European art schools, from whose work, to put it charitably, he wishes to gather inspiration? It is because he has not the breadth of mind to understand that this is one of the lines upon which the national architecture will be developed, and the genius of the country will find expression in a straightforward, honest and uncompromising manner, with pride in the nation that made such a building a possibility as well as a necessit[y].

Electricity ❧ A. E. Kennelly

President of the American Institute of Electrical Engineers.

A FORECAST of the electrical possibilities of the coming century is much more difficult than mere prophecy in any of the ordinary events of life, because to do justice to the future in the light of the achievements of the past is to do violence to the understanding. Whoever would have suggested in the year 1801 that before the nineteenth century closed we should be speaking from New York to friends in Chicago would probably have been looked upon as mentally deranged. And yet this is only one of the marvellous achievements which the nineteenth century has placed within our grasp. So far as scientific facts are within our possession, we are absolutely unable to determine what new discoveries or new inventions may be arrived at within the course of the next hundred years. It is entirely unreasonable, however, to suppose that the enormously rapid development both of discovery and invention which the

nineteenth century has witnessed can be suddenly arrested as we pass the threshhold of the twentieth century. On the contrary, it is only reasonable to suppose that the more we learn as a community, and the more we accomplish as a race, the more readily shall we acquire further knowledge and the more completely shall we obtain a grasp upon the resources of nature.

Even if no further discoveries were brought to light in the next half century, it would take practically all of that time completely to garner the harvest that already lies in the field of electrical progress ready for the hand of the reaper. In other words, so much has recently been accomplished and rendered possible by means of electricity that it would probably require nearly half a century to completely utilize the results which have already been reached. For example, the possibilities have been opened to us in the last few years of communicating electrically without wires to a distance. It is readily possible that this distance can be enormously increased by means which may come gradually and without the aid of any startling discovery. It is also possible that a number of such wireless messages may be transmitted in the same neighborhood without conflicting or disturbing each other. This feat alone will probably require years of development and widespread industry to bring about.

In the direction of the electric light very great improvement is possible, and consequently such improvement may fairly be counted upon among the possibilities of the future. At the present time the best known processes only yield a small fraction of one per cent of the power which is liberated from burning coal or from moving water into the luminous energy which affects our eyes as light. There would be no impossibility in increasing many times the yield of light per ton of coal consumed.

As regards motive power, we may well expect the electro-mobile to be the great vehicle of the future within cities, but it is practically impossible that the electro-mobile can become capable of running for long distances in the open country until some further discovery or development takes place in electric storage batteries. There is no reason, however, so far as can be at present perceived, why storage batteries should not be greatly improved, but the task has been one of great difficulty up to the present time.

A magnificent future opens to the chemical and metalurgical applications of electricity. The advance in this direction has been most rapid in the last ten years, and we seem to be only on the threshold of the possibilities in these directions. In fact, it is quite possible that such electrical applications might in time overshadow in importance all existing applications combined. It might be well within the bounds of possibility that a hundred years hence the telegraph, telephone and electric motor of to-day should be considered as merely minor aids and ancillary assistants to humanity by comparison with the electrical giants of the future yet unborn.

There can be little doubt that in time to come electricity will be so merged with mechanics that the two sister sciences and industries will no longer be separable. Electricity will no doubt permeate every large engineering enterprise, and in fact will be so far merged in general engineering that no great engineering achievement will be possible without electrical application and assistance.

Democracy ❧

IT has sometimes interested me to speculate on what would have been the position of this country had England acceded to the demands of the American colonies. Naturally, we should have had no Revolution; our area of development would have probably been confined to between the Mississippi and the Atlantic. We would have been of a more distinctly Anglo-Saxon type, to be sure, but of a less enterprising character, and our population would have hardly exceeded fifteen millions in number.

At all events, our growth must have been far less rapid than it has been, for there would have lacked any great impulse to immigration.

The democracy which we inaugurated acted as a far-reaching and bright-colored advertisement to the world to draw laborers to our vineyard. Because we could promise so much more than any

other country they came, not the weaklings of any race, but the strong and vigorous of all races whom circumstances and conditions had repressed. Moreover, democracy by encouraging freedom of thought encourages self-reliance. Democracy is associated, too, with a pronounced hopefulness, the hopefulness that makes every American boy aspire to become a President, the hopefulness that makes every little village aspire to become a great city, and by dint of much aspiring to often at last become one.

Thus democracy has been our animating spirit, so to speak, the spirit of assuming that we could accomplish anything, the spirit of self-reliance, of push and even of spread-eagleism, if you like.

The necessities of America and its rapidly expanding population, co-related with democracy, as I have tried to show, gave the great impetus to railway development, and railway development has revolutionized society. Consider the condition of our laboring classes. They are better off than those of any country in the world, and their wages, in all save house rent in a few congested centres, have a greater purchasing value. The necessities of life are all cheaper, too, and the luxuries of to-day become the necessaries of to-morrow. That this improvement is principally due to our railway system and its cheapened rates is incontrovertible. Democracy, too, has equally fanned our success in other fields. The hopefulness which is one of the elements of democracy makes the American mechanic do more, accomplish more and develop a higher skill than the workmen of any other land. Over a continually increasing area of the world his assistance is daily being called upon to fit up and put together the different parts of bridges, of engines and of the other various industrial mechanisms and implements America exports.

Besides, we have given a different interpretation to democracy than the world had previously been led to believe was possible. We have shown that it is connected with order, that under its aegis property is secure and the rights of the minor … been t… not on… lowed it… tion mea… as demo… ative sy… almost a… Cabinets… in the … newly … over a y…ar, … popular bran… Parliament is … Congress is not. … preme Court to … tionality of the law… Lastly, the reform … of her colonial af… based on the exper… losses. Thus we se… can influence on E… perhaps but one si… not profited by our … tending the suffra… alone is as autocrat…

In looking back … tury, there stand o… as it were, to ma[r]k … less materialisti… yet touched on. … words of Genera[l] …

surrender, he told … ers of the Confe… horses for their Sp… be fairly held to r… ness of democracy. … mocracy in analog… to seek. The Wor… must undoubtedly … triumph of democ… Cabin" may well be … ary triumph of democ… war, welding us into … nation, must be ev… great political trium…

Upon these severa… of our national de… look back with pr… grow in number … the grand figure of de… have reserved for the… growing greater, larger … ically heroic every da… coln. He personifies Am… its struggles, its success… sibilities in a way that … does, and no one else w… do.

I may be excused if … and only personal recoll… must have been but a sl… ing his assassination … boy, I happened to be w… of Washington with my … opposite the Treasury … down its broad marble f… saw him descending. … dier in a worn and … ran forward and pres… petition. Mr. Lincoln … ed his spectacles, sat … and, twining one of hi… the other, proceeded to r… see him sitting there w… tinctness of a silhouet… per against the white … tening marble. The … plicity of his action … itarianism which it e… the affections of the … hold which I have en… Yes, he is the grand … of democracy, and i… with the ages.

Submarine Navigation

By John P. Holland,

Inventor of the Holland Submarine Torpedo Boat.

SUBMARINE navigation will always have its limits. We know what those limits are, however, and already we are in a position to build vessels which will approach them very nearly. As the appreciation of these limits is very necessary in dispelling such illusions as the "Twenty Thousand Leagues Under the Sea" dream of Jules Verne, it is well that they should be stated at the outset. Navigation under the sea can by no possibility be carried on at a depth greater than 300 feet. The pressure of the water below that depth is so great that any boat man could build would be crushed. It is impossible for a man to work under water lower than 150 feet below the water's surface. Again, it will never be possible for submarine boats to travel as fast as vessels on the surface. This is because a vessel under the water [n]ecessarily has more weight of surface th[a]n one above it, and there is an increase[d] resistance resulting.

These limits which na[t]ure has set to sailing under the sea gi[ve] a good index to the uses to which sub[m]arine navigation will be put in the f[ut]ure. We must realize at once that it w[il]l never be possible to recover very mu[c]h property lost by shipwreck at sea. The exception will be in comparatively shallow water, in which, even already, di[v]ers can and do work with perfect impu[n]ity.

It is strange that both those who have studied the problem of [subm]arine navigation and those who … accomplish something with … [navi]gation agree that the first use … [v]essels will be for purposes of … [It seem]s to me that the principal … [subm]arine boats will always be … [T]he submarine torpedo boat ca… one of the most dangerous en… tion man has yet con… boats must always b… small, however. They … move quickly and t… great agility. The b… I constructed, is 53 fee… 10 feet 3 inches in diam… lieve practicable torped[o] …

der water can ever be constructed which will be much larger than this. These boats, in the first place, must be able to work in channels and harbors. Hence the depth of such waters will always be a limit to the size of torpedo boats which can work under water in them. If the boats were to be very long for their diameters, they would be very unhandy, whereas it is a cardinal requisite that they be exceedingly lively. The dimensions of the future submarine war boat may be a foot or two larger than my boat either way, but I do not believe the increase can …

vessels can carry a boatload of men to the bottom of a body of water and remain there during the whole of a working day. Foundations can be laid with the same accuracy that is maintained on land above water. Materials can be carried below and utilized with great rapidity. A submarine boat will also be extremely valuable for surveying the topography of land under water. Boats can proceed along the surface of the bottom and by automatic registers obtain with absolu[te] … the precis[e] formation …

the English Channel, would be free from the inconveniences of storms and heavy seas. Vessels could be built which would automatically remain at a certain depth below the surface, and arrangement[s] could be perfected by which boats goin[g] in opposite directions would move at d[if]ferent depths, thus avoiding all possib[il]ity of collision.

The problem of submarine navigati[on] has been solved, not by the applicat[ion] of the principles upon which the fish swims under water, but by utilizing a few simple principles of mechanics. The fish swims by inflating his body with air when he wishes t… [sur]face of the water, a… when he wis… cable subm… as near as … of wa…

second chamber bef… entirely, so that fi… normal pressure. … varied one ounce t…

The speed of un… ited by the power … them. Electric sto… all cases be use… made with petrole… with other propelli… of them proved of … to operate safely … The invention of th… tery has made subr… sible for practicab… …sed the poss…