The Open Court

A MONTHLY MAGAZINE

Devoted to the Science of Religion, the Religion of Science, and the Extension of the Religious Parliament Idea

Editor: Dr. Paul Carus. *Associates:* E. C. Hegeler. Mary Carus.

VOL. XXII. (No. 12.) DECEMBER, 1908. NO. 631.

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THORWALDSEN'S STATUE OF CHRIST.

Frontispiece to The Open Court.

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THE REAL JONATHAN EDWARDS.

BY I. WOODBRIDGE RILEY, PH. D.

IN a variety of metaphors Jonathan Edwards has been presented as an exponent of an odious Puritanism, the very embodiment of the sulphurous side of Calvinism. The greatest of American divines has been called the fire-brand philosopher, the black-winged raven of the North, the relentless logician who left the print of his iron heel upon the New England conscience.

These figures present the truth, but not the whole of the truth. It is true that Edwards delivered the dreadful Enfield sermon, *Sinners in the Hands of an Angry God,* and that he composed that pitiless treatise concerning *The Freedom of the Will* which belied its title, and doomed the bulk of mankind to the workings of an inexorable fate. But this is only one side of the picture. It is true that Edwards employed an unrelenting logic, it is also true that his powers of argumentation were equalled by his deep and strong and tender feeling. So while tradition has represented him as a sort of bloodless spectre, with pale, drawn face, recent scrutiny has found a mind more congruous with the beaming eye and sensitive mouth of his portrait. In a word, when freed from the dust of the past, the real Edwards shines out as a poet, a mystic and a philosopher of the feelings. Thus like another Dante he portrays her whom he loved as if she were another Beatrice, and like the author of the *Inferno,* he advances to a *Paradiso,* as when in one of his rhapsodies he says: "We have shown that the Son of God created the world for this very end—to communicate Himself an image of His own excellency....When we behold the light and brightness of the sun, the golden edges of an evening cloud, or the beauteous bow, we behold the adumbrations of His glory and goodness; and in the blue sky, of His mildness and gentleness. There are also

many things wherein we may behold His awful majesty: in the sun in his strength, in comets, in thunder, with the lowering thunder-clouds, in ragged rocks and the brows of mountains."

The most notable fact in the early life of the Connecticut writer was his precocious possession of the powers both of imagination and of observation. Born in 1703, three years before Benjamin Franklin, and taught by his father, a graduate of Harvard, to read with pen in hand, Edwards while a student at Yale College, between the ages of fourteen and seventeen years started two notebooks entitled *Mind* and *Natural Science*. Of these the former has been declared to resemble the *Thoughts* of Pascal, the latter to approximate to the theories of Franklin. But even earlier than these remarkable undergraduate productions were two pre-collegiate papers written when their author was not more than twelve years old. The first of these was a little letter which, as a specimen both of wit and reasoning, in a child, Edwards's biographer says may fairly claim to be preserved. Written evidently to a boy older than himself the letter begins thus:

"I am informed you have advanced a notion, that the soul is material and attends the body till the resurrection; as I am a professed lover of novelty, you must imagine I am very much entertained by this discovery; (which however old in some parts of the world, is new to us;) but suffer my curiosity a little further. I would know the manner of the kingdom, before I swear allegiance. First, I would know whether this material soul keeps with [the body] in the coffin; and, if so, whether it might not be convenient to build a repository for it; in order to which, I would know what shape it is of, whether round, triangular, or four square; or whether it is a number of fine strings reaching from the head to the foot, and whether it does not lead a very discontented life...."

About the same time as this bantering letter which was written, in all probability, in the year of the accession of George I, there came one more serious and on a different topic. Edwards's father had been writing to some foreign correspondent recounting certain interesting natural curiosities of the New World. To this correspondent the younger Edwards made bold to write the following epistle on the *Habits of the Flying Spider*:

"May it please your Honour. There are some things which I have happily seen of the wondrous ways of the working of the spider....Everybody that is used to the country knows their marching in the air from one tree to another, sometimes at the distance of five or six rods. Nor can one go out in a dewy morning at the

latter end of August and the beginning of September, but he shall see multitudes of webs, made visible by the dew that hangs on them, reaching from one tree, branch and shrub to another. . . . But I have often seen that, which is much more astonishing. In very calm and serene days in the forementioned time of year, standing at some distance behind the end of an house or some other opake body, so as just to hide the disk of the sun and keep off his dazzling rays, and looking along close by the side of it, I have seen a vast multitude of little shining webs, and glistening strings, brightly reflecting the sunbeams, and some of them of great length, and of such a height, that one would think they were tacked to the vault of the heavens, and would be burnt like tow in the sun, and make a very beautiful, pleasing, as well as surprising appearance. . . . But that which is most astonishing, is, that very often appear at the end of these webs, spiders sailing in the air with them; which I have often beheld with wonderment and pleasure, and showed to others. . "

Edwards as a naturalist discoursing on subjects from atoms to comets, from trees to ocean winds, presents a forgotten side of Puritan culture, that true love of nature exemplified by Cotton Mather when about this time he said: "The world's various parts, curious ends, incomparable order are the sensible stamps of an universal power and wisdom and goodness." Then too it is to be remembered that Edwards in his *Notes on Natural Science* was gathering materials for an intended work which he hoped would exhibit him as the eighteenth century ideal of a polymath, of a scholar of wide and varied learning. This was a truly sophomoric ambition, for the intellectual impulse to the scheme came in the student's second year at college when, meeting with Locke's *Essay on the Human Understanding,* he confesses to have read it with a far higher pleasure than the most greedy miser finds when gathering up handfuls of silver and gold from some newly discovered treasure. Yet even before he had fallen in with this stimulating work, the juvenile speculator had been at work on a little metaphysical essay of his own entitled *On Being.* A recent critical examination of the original manuscript, with its bad spelling, its absence of punctuation, has proved the authenticity of this document, which has been pronounced akin, if not identical with the idealism of the great Irish idealist, Bishop Berkeley. To prove that all existence is mental, that the material universe exists nowhere but in the mind, the youthful American argues as follows concerning the inconceivability of a state of nothingness, the infinity and divinity of space, and the spirituality of substance:

"That there should be absolutely nothing at all is utterly impossible, the Mind Can never Let it stretch its Conceptions ever so much bring it self to Concieve of a state of Perfect nothing, it put's the mind into mere convulsion and Confusion to endeavour to think of such a state, and it Contradicts the very nature of the soul to think that it should be, and it is the Greatest Contradiction and the Aggregate of all Contradictions to say that there should not be, tis true we Cant so Distinctly show the Contradiction by words because we Cannot talk about it without Speaking horrid nonsense and Contradicting ourselve at every word, and because nothing is that whereby we Distinctly show other particular Contradictions, but here we are Run up to Our first principle and have no other to explain the Nothingness or not being of nothing by, indeed we Can mean nothing else by nothing but a state of Absolute Contradiction; and If any man thinks that he Can think well Enough how there should be nothing I'll Engage that what he means by nothing is as much something as any thing that ever He thought of in his Life, and I believe that if he knew what nothing was it would be intuitively Evident to him that it Could not be....

"If a man would imagine space any where to be Divided So as there should be Nothing between the Divided parts, there Remains Space between notwithstanding and so the man Contradicts himself, and it is self evident I believe to every man that space is necessary, eternal, infinite & Omnipresent. but I had as Good speak Plain, I have already said as much as that Space is God, and it is indeed Clear to me, that all the space there is not proper to body, all the space there is without ye Bounds of the Creation, all the space there was before the Creation, is God himself, and no body would in the Least stick at it if it were not because of the Gross Conceptions that we have of space....

"Let us suppose for illustration this impossibility that all the Spirits in the Universe to be for a time to be Deprived of their Consciousness, and Gods Consciousness at the same time to be intermitted. I say the Universe for that time would cease to be of it self and not only as we speak because the almighty Could not attend to Uphold the world but because God knew nothing of it....

"Corollary. it follows from hence that those beings which have knowledge and Consciousness are the Only Proper and Real And substantial beings, inasmuch as the being of other things is Only by these. from hence we may see the Gross mistake of those who think material things the most substantial beings and spirits more like a shadow, whereas spirits Only Are Properly Substance."

This essay *On Being,* which deals with the most abstruse and rarefied of subjects, is nevertheless relieved by certain poetic and imaginative passages, as when it is said that to think of nothing is to "think of the same that the sleeping rocks dream of," and "a state of nothing is a state wherein every proposition of Euclid is not true." But this is not the most astonishing of the productions of the undergraduate of the College of Connecticut, for two or three years later came those *Notes on the Mind* wherein the boy of sixteen or seventeen set forth a definition of immaterialism, which has been declared truly marvelous, even if it be held that at this time Edwards was a veritable Berkleian, and had actually borrowed from the good bishop, before the latter had come to the American strand. As a keynote to his deepest spiritual life, and as a hint to the earlier and perhaps independent origin of Edwards's idealism is this corollary to a note on space, its existence and infinity:

"And, indeed, the secret lies here: That, which truly is the Substance of all Bodies, is *the infinitely exact, and precise, and perfectly stable Idea, in God's mind, together with His stable Will, that the same shall gradually be communicated to us, and to other minds, according to certain fixed and exact established Methods and Laws;* or in somewhat different language, *the infinitely exact and precise Divine Idea, together with an answerable, perfectly exact, precise, and stable Will, with respect to correspondent communications to Created Minds, and effects on their minds.*"

Whence did the provincial undergraduate obtain this his conviction that the world is an ideal one? There is no positive proof to be adduced in favor of Edwards's acquaintance with the works of Berkeley at this time, for the most idealistic of the tutors of Yale College had not as yet fallen under the spell of the Irish idealism. But the question of historicity is not of such vital importance as that of personality. Even if we knew all the strands in the speculative web that would not explain the originality of the pattern. Hence the latest investigation has carried the problem back from external to internal sources, and has sought to attribute the origin of Edwards's philosophical immaterialism to his personal mysticism. It appears that it was his quietistic experiences which led him so early to a real belief in the unreality of the external world. Here without recurring to the ancient formulas, Edwards's conviction, that corporeal things can exist no other wise than mentally, may be explained in modern terms. Briefly put, the recognition of the unreal sense of things is due to a certain loss of the feeling of the compact

reality of the physical organism. In a word, to the mystic in his quietistic state, as the body seems less real, the spirit seeems the more real.

How is this apparent abnormality to be defended? To the robust believer in the superior reality of material things, such an experience might appear a mere negation, a futile deduction from a state of blank unconsciousness. Not so to Edwards; to him as to the true mystic of every age there came the positive conviction that to the individual there is vouchsafed direct and intuitive knowledge of truth. But this does not arise without preparation, for there are three stages in the process: first, comes by great and violent inward struggles the gaining of a spirit to part with all things in the world; then, a kind of vision or certain fixed ideas and images of being alone in the mountains or some solitary wilderness far from all mankind; finally, a thought of being wrapt up in God in heaven, being, as it were, swallowed up in Him for ever. In these few words Edwards has summed up the mystic progression presented in the ancient manuals, those three stages in the ladder of perfection, —first, the purgative, brought about by contrition and amendment; then, the illuminative produced by concentration of all the faculties upon God; lastly, the intuitive or unitive wherein man beholds God face to face and is joined to Him in perfect union. In a passage of exquisite beauty, which may well be called a classic of the inner life, the saint of New England thus proceeds to unfold the record of his youthful ecstacy:

"After this my sense of divine things gradually increased, and became more and more lively, and had more of that inward sweetness. The appearance of everything was altered; there seemed to be, as it were, a calm, sweet cast, or appearance of divine glory, in almost everything. God's excellency, his wisdom, his purity and love, seemed to appear in every thing; in the sun, moon, and stars; in the clouds, and the blue sky; in the grass, flowers, trees; in the water, and all nature; which used greatly to fix my mind. I often used to sit and view the moon for continuance; and in the day, spent much time viewing the clouds and sky, to behold the sweet glory of God in these things: in the mean time, singing forth, with a low voice, my contemplations of the Creator and Redeemer. And scarce any thing, among all the works of nature was so sweet to me as thunder and lightning; foremerly, nothing had been so terrible to me. Before, I used to be uncommonly terrified with thunder and to be struck with terror when I saw a thunder-storm rising; but now, on the contrary, it rejoiced me. I felt God, so to speak, at the

first appearance of a thunderstorm; and used to take the opportunity, at such times, to fix myself in order to view the clouds, and see the lightnings play, and hear the majestic and awful voice of God's thunder which oftentimes was exceedingly entertaining, leading me to sweet contemplations of my sweet and glorious God. While thus engaged, it always seemed natural to me to sing, or chant forth my meditations; or, to speak my thoughts in soliloquies with a singing voice. Holiness, as I then wrote down some of my contemplations on it, appeared to me to be of a sweet, pleasant, charming, serene-calm nature; which brought an inexpressible purity, brightness, peacefulness, and ravishment to the soul. In other words, that it made the soul like a field or garden of God, with all manner of pleasant flowers; all pleasant, delightful, and undisturbed; enjoying a sweet calm, and the gently vivifying beams of the sun. The soul of a true Christian, as I then wrote my meditations, appeared like such a little white flower as we see in the spring of the year; low, and humble on the ground, opening its bosom, to receive the pleasant beams of the sun's glory; rejoicing, as it were, in a calm rapture; diffusing around a sweet fragrancy; standing peacefully and lovingly, in the midst of other flowers round about; all in like manner opening their bosoms, to drink in the light of the sun. There was no part of creature-holiness, that I had so great a sense of its loveliness as humility, brokenness of heart, and poverty of spirit; and there was nothing that I so earnestly longed for. My heart panted after this,—to lie low before God, as in the dust; that I might be nothing, and that God might be ALL."

Not far from the time of the experiences here portrayed, Edwards began his public career by supplying the pulpit of a small church in New York, whence he "used frequently to retire into a solitary place on the banks of the Hudson's River for contemplation on divine things." Returning to Yale College in 1723 to receive his master's degree, and retained as tutor for two years, he was married in New Haven to the beautiful Sarah Pierrepont whose house still stands on the green adjoining the College precincts.

In 1727 being settled as colleague-pastor with his grandfather, the Reverend Solomon Stoddard, in the town of Northampton, and in 1729 succeeding to the full pastorate, Edwards during the next fifteen years composed such works as his sermons on *Man's Dependence* and on *Justification* and such treatises as those on *Surprising Conversions* and *Distinguishing Marks*. But at the same time with his *Thoughts on the Revival* which spread through his parish, certain unpublished manuscripts show that the Puritan divine's

household was as much engaged in domestic as in ascetic interests. Thus, in some papers preserved from the year 1743, we find a jeweler's account to Mrs. Edwards of "a gold Locket & Chane" for £11, and to Edwards himself two charges, at three months intervals, for "one dozen long pipes." But what is most surprising in these memoranda is an entry for "1 childs Plaything, 4/6," made by the very man accused of calling children "little vipers."

And so too in the following year, and as a further token of the softer side of the great preacher, there remains a portion of a sermon written on a leaf of an old copybook of his daughters Mary and Esther. Of these daughters, it will be remembered, the one was destined to be the mother of the elder President Dwight of Yale College, and the other the mother of Aaron Burr of Princeton College, to the presidency of which institution Jonathan Edwards was himself to be called but only there to die.

But to return to Edwards the mystic and the records of his interior life. How truly he was a philosopher of the feelings, a fervent exponent of the dialectic of the heart, was now shown in the more elaborate writings of his maturity. As the fruit of his earlier meditations and of the thirteen hours of daily study with which he was accredited, the recluse of Northampton, between 1734 and 1746 produced two works of high significance, the one a sermon on *Spiritual Light,* the other a treatise on the *Religious Affections* which was composed in the year in which the College of New Jersey was founded. In the former of these writings the author is a confessed advocate of rational doctrine, for he contends that the spiritual light does not consist in any impression made upon the imagination as when one may be entertained by a romantic description of the pleasantness of fairy-land, or be affected by what one reads in a romance, or sees acted in a stage-play. No, rather as he that beholds objects on the face of the earth, when the light of the sun is cast upon them, is under greater advantage to discern them in their true forms and natural relations, than he that sees them in a dim twilight, so God, in letting light into the soul, deals with man according to his nature and makes use of his rational faculties.

While, so far as Edwards was concerned, the objects of the mystical knowledge were as substantial realities as the mountains of Berkshire, yet he felt obliged to bring home to others the proper rationality of that knowledge. Then, too, the treatise on the *Religious Affections* being called forth by the revival which had meanwhile swept over his parish, the Puritan divine was in a further

difficult position, for he stood midway between the sceptics of his age and those persons who were of abnormal emotional sensibility. On the one side, he explains, are many in these days who condemn the affections which are excited in a way that seems not to be the natural consequences of the faculties and principles of human nature; on the other side are those of a weak and vapory habit of body and of brain easily susceptive of impressions; as a person asleep has dreams of which he is not the voluntary author, so may such persons, in like manner, be the subjects of involuntary impressions, when they are awake. But the true saint belongs to neither of these. In him the divine spirit may co-operate in a silent, secret and undiscernible way, with the use of means, and his own endeavors, and yet even that is not all. Spiritual light may be let into the soul in one way, when it is not in another; in a dead carnal frame, it is as impossible that it should be kept alive in its clearness and strength as it is to keep the light in the room when the candle that gives it is put out, or to maintain the bright sunshine in the air when the sun is gone down.

In many parts of his treatise on the *Religious Affections* the eighteenth century scholar, in a measure, anticipated the results of the modern psychology of religion. But ultimately he was forced to give up the rationality of his thesis that the soul is enabled, by intuition, to progress from the world of shadow to the world of substance and to have recourse to such figures of speech as that, not only does the sun shine in the saints, but they also become little suns, partaking of the nature of the fountain of their light. A similar recourse to the figurative at the expense of the rational was exhibited in the next two treatises of the Massachusetts divine. It was in the midyear of the century that Edwards was forced by an unhappy estrangement from his pastorship at Northampton, and was compelled to engage in arduous missionary labors among the Indians at Stockbridge. Nevertheless he succeeded in composing in these hard times what have been considered the greatest of his works.

In the practical denial of its title; the *Inquiry on the Freedom of the Will* was both an unexpected aid to the beleaguered fortress of Calvinism, and an instrument to give to its author the reputation of being, in logical acuteness, the equal of any disputant bred in the universities of Europe. That *Inquiry* was written under strange circumstances. Far from the haunts of scholarship, on the edge of the Western wilderness, and in actual peril of the inroads of the savages, Edwards is still at pains to stop and explain his method

of investigation by a labored defence of the most abstruse branch of learning—metaphysics. "Let not the whole be rejected," he exclaims, " as if all were confuted by fixing on it the epithet *metaphysical.* The question is not, whether what is said be metaphysics, physics, logic, or mathematics, Latin, French, English or Mohawk, but whether the reasoning be good, and the arguments truly conclusive. It is by metaphysical arguments only we are able to prove, that the rational soul is not corporeal, that lead or sand cannot sink, that thoughts are not square or round, or do not weigh a pound. . . . It is by metaphysics only that we can demonstrate, that God is not limited to a place, or is not mutable; that he is not ignorant, or forgetful; that it is impossible for him to lie, or be unjust; and that there is one God only, and not hundreds of thousands. And, indeed, we have no strict demonstration of anything, excepting mathematical truths, but by metaphysics."

Of the contents of the famous *Inquiry on the Will* it is unnecessary to speak; as a sheer *tour de force* it is unsurpassed in the annals of early native philosophy. And yet it is not so dry and abstract as tradition would allow. Even in its initial explanatory sections it contains many touches of concrete imagery. Thus against the supposition that the will may act in a state of perfect indifference, Edwards says that, for example, being asked to touch some square on a chessboard, my mind is not given up to vulgar accident, but makes the choice from foreign considerations, such as the previous determination to touch that which happens to be most in my eye. And against the similar contention that the mind can be in a state of perfect equilibrium, Edwards says that even the involuntary changes in the succession of our ideas, though the cause may not be observed, have as much of a cause as the continual, infinitely various, successive changes of the unevennesses on the surface of the water.

It is another singular fact that, while Edwards was engaged in the most metaphysical of his tasks, he was also exhibiting the most practical side of his character. The philosopher might be reasoning on behalf of the determinism of the will, the doctrine that humanity, in all its acts, is under a fatal necessity; at the same time the man showed the most wilful determination in both private and public affairs. In the very period when the *Enquiry* was under way, Edwards was struggling with dire poverty. There is a pathetic reminder of this in that one of his note-books was written on certain crescent-shaped scraps of thin soft paper, said to have been used by his wife and daughters in making fans.

But domestic straits did not prevent the speculative divine from taking a vital interest in affairs of state. Upon his removal to Stockbridge, shortly after the war with the Indians and French, known as King George's War, Edwards apprised the Speaker of the Massachusetts House of Assembly of the efforts made to induce his charges, the Mohawks, and other tribes of Iroquois, to emigrate into Canada. And another paradoxical contrast between the philosopher and the practical man was seen in the fact that, in the very year in which he was reading the subtle sceptic David Hume, he addressed a letter to one of his Scottish correspondents, on the conduct of the war then waging with the savages. In this letter of 1755 Edwards protested that the English ministry missed it very much in sending over British forces to fight with Indians in America. Let them, he continues, send us arms, ammunition, money and shipping; and let New England men manage the business in their own way, who alone understand it. To appoint British officers over them, is nothing but a hindrance and discouragement to them. Let them be well supplied, and supported, and defended by sea, and let them go forth under their own officers and manage in their own way, as they did in the expedition against Cape Breton.

In the same year as this sagacious letter, and as another evidence of the many-sided character of the Puritan scholar, there was written the most boldly imaginative of his treatises, the *Last End in Creation.* In this, as the author's chief expositor affirms, there appeared, with something of the beauty which had fascinated the vision of his youth, that other element of his thought which, though subordinated, was never annihilated, that conception of God which Plato, Spinoza or Hegel might have held,—the idea of the good, the one substance, the absolute thought unfolding itself or embodying itself in a visible and glorious order. Of this treatise little can be said, save as its poetic imagery completes, as by a golden frame, the portrait of the man. Here there were exhibited those shining conceptions so congruous with the thoughts of the mystic and idealist, for in using the familiar figures of the infinite fountain of good sending forth abundant streams, Edwards did but show what he was wont to call a knowledge in a sense intuitive, "wherein such bright ideas are raised, and such a clear view of a perfect agreement with the excellencies of the Divine Nature, that it is known to be a communication from Him; all the Deity appears in the thing, and in everything pertaining to it."

THE VERA ICON, KING ABGAR, AND ST. VERONICA.

BY THE EDITOR.

[CONCLUSION.]

WE have seen in our last article that the name Veronica is by some scholars regarded as a corruption of *vera icon,* i. e., "true image"; and by others as a modification of the name Berenice; and the latter theory is deemed not improbable by even so high an authority as Franz Xaver Kraus, presumably the most scholarly art critic of Roman Catholic antiquities. Without deciding between the two alternatives, he appears to accept the name Berenice as the more authentic, because older, form and calls attention to the fact that it occurs as early as in the writings of John Malala.

The name Berenice sounds indeed very different in English from Veronica, but we must bear in mind first that *c* is pronounced *k* in both, for it corresponds to the Greek *kappa,* and that the Greek *B* is soft so as to resemble the Latin *V*. For instance the Greek *baino** appears to have sounded, at least at certain times and in certain dialects of Greece, very much like its Latin counterpart *venio* (i. e., I come), and the transcription of the Hebrew name of God corresponding to the consonants J H V H is transcribed by Eusebius *Jabeh.*† Further the end *e* (η) sounds in Doric and Aeolic *ah* (α). Thus Berenice or *Berenike* was in some dialects pronounced *Verenika,* of which Veronica could easily be a mere modification; and we must grant here that in Christian legends (as stated by Kraus) Berenike appears long before the name Veronica with which in the later Latin versions it has been identified.

Such are the considerations which speak in favor of the derivation of Veronica from Berenike, yet a closer inspection of the material at hand will prove that there is no reason to repudiate the

* βαίνω. † Ἰαβέ.

ST. VERONICA.
By Wilhelm Meister.

well-established derivation of Veronica from *vera icon,* which we can trace in its very origin. Even after the formation of the Veronica legend, which is quite late, the word *Veronica* as an equivalent of *vera icon,* in the sense of "true likeness," viz., of Christ, or even "a copy of the true likeness," continued for a long time to remain in use.

There are some passages in the Apocryphal gospels and in the Church Fathers which refer to a statue erected by a woman mentioned in the Gospels[8] who was healed of the issue of blood by touching the hem of Christ's garment. She is sometimes called Berenike, and this Berenike is called in Latin versions Veronica. The name Berenike appears for the first time, so far as can be gathered from the material at our command, in the *Chronographia* of John Malala,[9] a Christian author of the sixth century whose account has been received among the Apocryphal gospels under the title "The Story of Veronica," and we may state here that in the original the name reads Beronike.[10] A matron Berenike is also mentioned in the Acts of Peter, Book XXIV, Chap. 3.[11] It is noticeable that in its primitive form the story of Berenike is not at all connected with the legend of St. Veronica. Accordingly we have two distinct stories which later on have been fused into one.

The story of Berenike is based upon a monument which actually existed in the city of Paneas, called by the Romans Cæsarea Philippi. The Church historian Eusebius mentions it (*Hist. Eccles.* VII, 18) and declares that he had heard of this statue of Christ and had traveled to Cæsarea Philippi where he had seen it himself. He relates that a woman who lived in the place had erected the monument to commemorate the miracle of her recovery, and he describes it as made of brass. It represented a female figure in the attitude of a supplicant on bended knees and with outstretched hands, while before her stood the figure of a man in erect posture with a cloak over his shoulders stretching forth his hands to her. He adds that at the pedestal of the statue there grew a certain herb which touched the hem of the man's garment and was regarded as a remedy for all kinds of disease. This statue of the man was regarded as a likeness of Christ, and, says Eusebius, "it existed down to my time and I went to the city and saw it myself."

[8] Matth. ix. 20-22; Mark v. 25-34; Luke viii. 43-48.

[9] Lib. X, pp. 304-308.

[10] Βερονίκη.

[11] *Actus vercellenses,* Chap. 3. Cf. also the German translation of the New Testament Apocrypha by Edgar Hennecke, p. 395.

ST. VERONICA.
By an artist of the German School.

The unequivocal existence of this statue is thus well attested, and the story that it had been set up by a contemporary of Christ, a woman whom he had healed, must have been in existence as early as in the third century. Eusebius wrote in the beginning of the fourth century, but he does not as yet name the woman. This was apparently done in a later phase of the legend's development, and we have seen that John Malala called the woman healed by Christ, "Berenike."

This same statue, as we learn from Asterius, was removed in the year 305 by Maximinus Daza, a pagan emperor who would naturally be inclined to remove the cause of Christian miracle stories, and Sozomen adds in his Church history (*Hist. Eccl.* V, 20) that Emperor Julian the Apostate had it replaced by a statue of his own. "But," says he, "a flash from heaven smote the statue, hurling the head and neck to the ground, where it continues to this day looking black as if burned by lightning."

Whether the original statue supposed to be Christ was destroyed by Julian is not clearly stated. The monument is referred to by later historians, such as Cassiodorus, Theophylact, Epiphanius, and Nicephorus, but was finally lost sight of, and we do not know what has become of it.

Now we must take up the question as to what this monument of Berenike has to do with Veronica.

It was sometimes customary among Roman authorities to transcribe foreign names by some familiar Latin name which was nearest to it in sound. Thus we know that Pope Xystos is called Pope Sixtus, or in Italian Sisto; the Gothic name Theodoric (the German Dietrich) is changed to Theodore although the several meanings of these words are radically different. In this way it is quite natural that the word Berenike was changed to Veronica, and it is not impossible that any such modification of the former as, e. g., occurs in Malala's chronicle where we read Beronike, is due to mistakes of a scribe who had the Latinized form of the name in his mind. Such changes may have crept into the text at a very late date.

One of the Latin versions of the Apocryphal gospels, "The Story of Veronica," tells the story of Berenike's monument and makes not the slightest reference to the legend of Veronica procuring a portrait of Christ on a handkerchief. This alone suggests the theory that originally the two stories of Berenike and of Veronica were distinct. If the author of this Apocryphal gospel had known of either the Veronica pictures or of the Veronica legend he would most assuredly have mentioned them.

A little more than thirty years ago a manuscript was discovered of Macarius Magnes,[12] one of the ancient Christian apologists who incidentally mentions the statue described by Eusebius, and he calls the woman Berenike, not Veronica nor Beronike, but adhering to the old well-known Greek name. This fact itself appears to be a verification of our proposition that the old Berenike legend based upon the actual existence of the bronze group at Paneas, had nothing to do with the other story of Veronica, but the two were identified at the time when the name Berenike was identified with Veronica in Latin translations.

It would be very interesting if we could prove that a statue of Christ existed as early as in the days of Eusebius, and that the statue had actually been erected by a contemporary of Jesus. But this view is highly improbable, not to say positively impossible; and art critics are not inclined to give it any credence. The probability is that the bronze group referred to by Eusebius does not represent Christ at all but the Emperor Hadrian, who on account of the care he took of the provinces might be called "the provincial Emperor."

Hadrian was born in Rome, but his ambition was to change the dominion of Rome into a real empire in which the rights of all should be respected. The Roman dominion was to become a state of which every one should feel that he was a citizen whether he lived in Rome or in the provinces. Hadrian traveled much through the empire, and wherever he came he showered bounties upon the inhabitants. He looked to the welfare of the people, founded useful institutions, and was naturally greeted as a benefactor of the various countries.

In consequence of his benevolence several monuments were erected to Hadrian which, however, have become lost and are preserved only on coins struck in commemoration of his visits. On these coins, of which some are here reproduced, we see Emperor Hadrian standing in the very attitude described by Eusebius, extending his hands in condescension to a woman (representing Spain, Africa, Gaul, or Greece) in the attitude of a supplicant, kneeling and raising her hands in grateful recognition of his kindness. It is more than merely possible that such a monument was also erected in Cæsarea Philippi, and that the people of the place spoke of it as representing their benefactor and saviour.

We must remember that since the days of Augustus the Roman emperors were actually addressed with the name "Saviour," and thus it is quite natural that the Christian population confused this pagan

[12] Edited by Blondel in 1876.

notion of a saviour with their own, and transferred their veneration for Christ upon this beloved provincial emperor, or perhaps also *vice versa*. There was the figure of a deliverer, there was a woman who had been healed by him. There were herbs touching the hem of the deliverer's garment, and they were used to cure the sick. It is quite plausible that in this way the group came gradually to be regarded as a likeness of Jesus.

The handkerchief of Veronica is frequently called by the Latin name *sudarium*, and in fact it is commonly known under this name in the collections of relics; but it must not be confused with another

HADRIAN, RESTORER OF THE WORLD.

HADRIAN, RESTORER OF THE GAULS.

HADRIAN, RESTORER OF SPAIN.

HADRIAN, RESTORER OF AFRICA.

ARRIVAL OF HADRIAN IN GAUL.

famous relic called the Sudarium of Christ which is kept at Corneli-Minster near Aix la Chapelle. This famous cloth is said to have been wrapped around the head of Jesus while lying in the tomb, and is supposed to have been purchased by Joseph of Arimathea together with the shroud, a fabric of artistic design ornamented with Greek crosses arranged in slanting and upright positions. One-half of the shroud is also to be found at Corneli-Minster. The sudarium of Christ is forty centimeters long and thirty centimeters broad. Its fibre is so delicate that though folded sixteen times it is still transparent. Our illustration shows it within a frame work

of ornamental embroidery as it is exhibited from time to time to the people.

Five European cities claim the possession of the genuine sudarium of Veronica: Turin, Toulouse, Besançon, Compiègne, and Sorlat. According to another and presumably an older tradition, Veronica's sudarium was folded three times and produced three original impressions, one of which it is said remained at Jerusalem, one went to Rome, and the other found its way to Spain.

JOSEPH OF ARIMATHEA'S SUDARIUM OF CHRIST.

The Veronica picture of Besançon is held in great veneration because it is said to have miraculously stayed the plague which visited the city in the year 1544, and the Brotherhood of the Holy Sudarium celebrates the 3d of May as the memorial day of this occurrence.

Among the several popes who encouraged a belief in the sanctity and miraculous power of the sudarium are John VII and Gregory XIII; and John XXII, who ascended the papal throne in 1613, composed a hymn in its glorification, granting to all those who

would repeat the lines in a pious contemplation of the picture, an indulgence of ten thousand days. This poem reads as follows:

"Salve, sancta facies
Mei Redemptoris
In qua nitet species
Divini splendoris.
Impressa paniculo
Nivei candoris.
Dataque Veronicae
Signum ob amoris.
Salve decus Seculi
Speculum Sanctorum
Quod videre cupiunt
Spiritus coelorum
Nos ab omni macula
Purga vitiorum
Abque nos consortio
Junge beatorum."

"Hail, thou, my Redeemer's Face.
Crowned with thorns and gory,
Where reside effulgent rays
Of divinest glory.
It was in a kerchief pressed
Of snow's purest whiteness
Given to Veronica
Pledge of love in brightness.
Hail, thou glory of the age,
Mirror of saints, holy,
Which are anxious to behold
Angels pious and lowly.
Cleanse us of all sins we pray,
Let them be forgiven;
May we join the company
Of the blessed in heaven."

This poem has become the prototype also of Protestant church hymns intended as free translations of Pope John's lines. The most beautiful among them is perhaps Paul Gerhard's song *"O Haupt voll Blut und Wunden,"* which has found its way in an English version also into the English hymn books, where the first and the last stanzas read as follows:

"O sacred Head, now wounded,
With grief and shame weighed down,
Now scornfully surrounded
With thorns, thine only crown;
O sacred Head, what glory,
What bliss, till now was thine!
Yet, though despised and gory,
I joy to call thee mine.

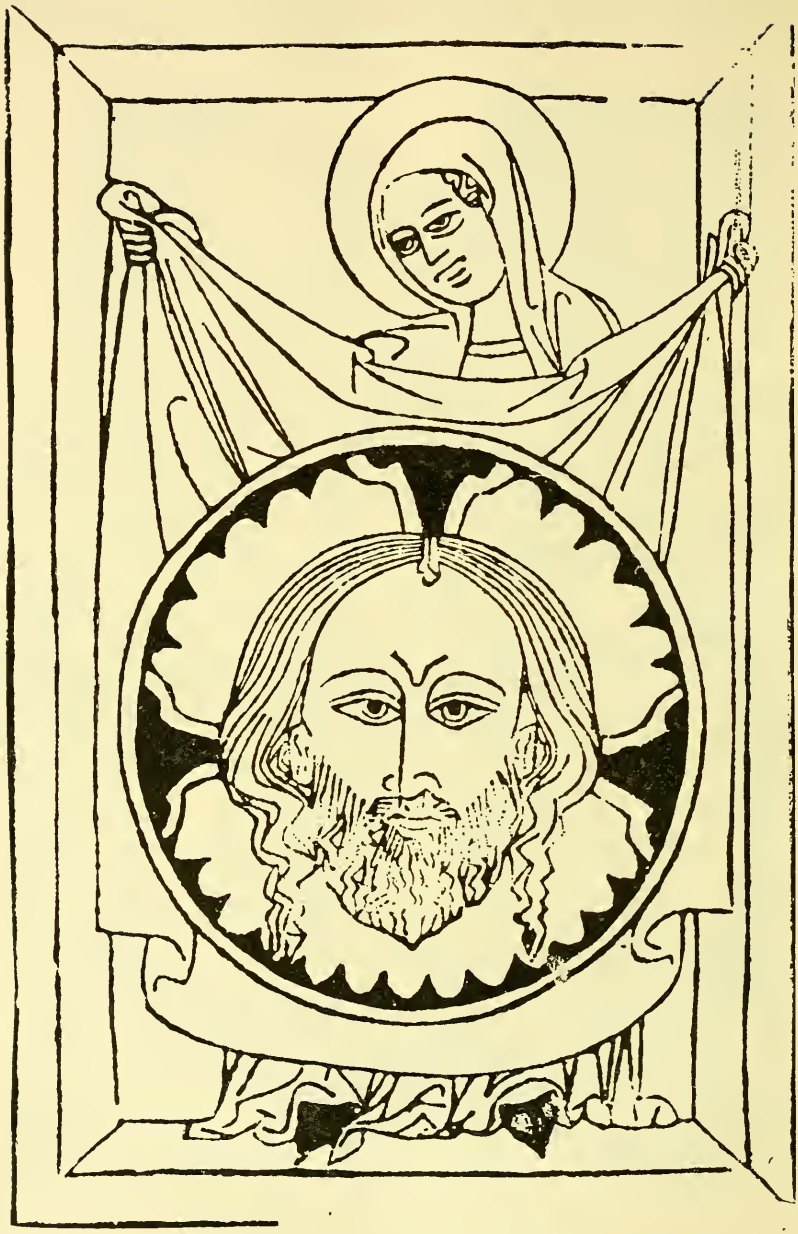
"Be near when I am dying,
Oh! show thy cross to me!
And for my succor flying,
Come, Lord, to set me free!
These eyes new faith receiving,
From Jesus shall not move;
For he who dies believing,
Dies safely—through thy love."

The Abgar pictures seem to have originated in the fourth century, and the Veronicas are apparent imitations of them; they can scarcely be older than the fifth century and came in vogue only in

the eleventh century, but then they became the most favorite pictures of Christian piety and were painted in innumerable copies.

ST. VERONICA RECEIVING THE PICTURE.
Engraving by Schongauer, 1420-1488.

In the passion play at Oberammergau, St. Veronica has not been forgotten. When Jesus breaks down under the burden of the



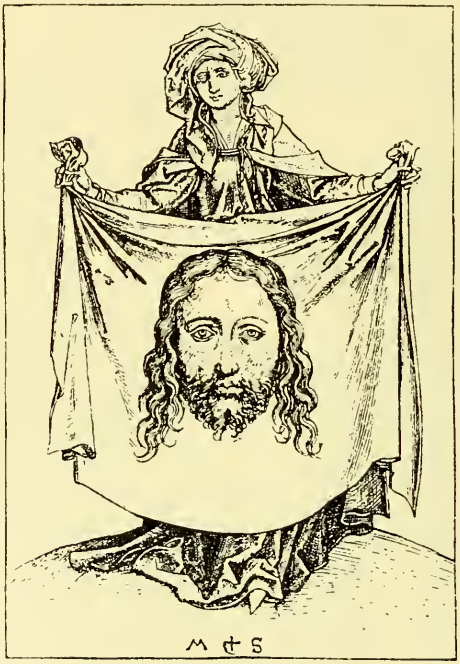
ST. VERONICA AND THE SUDARIUM.
Woodcut from an early block book.

cross, she approaches and offers him her handkerchief to wipe off the blood and sweat from his face. Christ answers, "Compassionate soul, My Father will reward thee." On returning the handkerchief

SS. PETER AND PAUL WITH THE SUDARIUM.
Engraving by E. S., 1467.

she displays it before the audience when lo! the picture appears imprinted on it.[13]

We meet with Veronica pictures at the very beginning of German xylography, and we here reproduce an illustration from one of the early block books which is preserved in the royal *Kupferstichkabinett* at Berlin. The outlines exhibit the endeavor of an artist striking out in a new line of work. In spite of its clumsiness we notice the effort to express grief in the face of Veronica, and a stern submission in the eyes of the Christ portrait. Among the



ST. VERONICA.

Engraving by Schongauer, 1420-1488.

more elegant copper engravings first developed with great skill by an unknown master whose signature consists of the initials E. S. together with the year of his engraving, we find a sudarium held up by SS. Peter and Paul with the papal coat of arms above it. The picture bears the date 1467, written in old-fashioned figures. Art

[13] Legends are not always improved by dramatization, and the story of Veronica as acted on the stage suggests that even before the invention of photography there were kodak fiends in the world.

critics admire especially the stern dignity of the two apostles while the head of Christ has been criticised.

Schongauer, the ingenious disciple of the master E. S., exhibits a tendency to bring out the contrast between the noble passion of Christ and the rude vulgarity of his executioners. The great artist of Kolmar has engraved several Veronicas from which we are able to present two reproductions—one illustrating the moment in which Veronica receives the portrait of Jesus on his way to Calvary and the other in the form of an outline vignette where she holds the sudarium up to view.

One of the most famous Veronica pictures has been painted by Zeitblom for an altar piece of Eschach and is now preserved in the Royal Gallery of Berlin. Claude Mellan, a famous engraver, has made a copy of Veronica's sudarium in one line for the purpose of

VERONICA.
By Zeitblom, 1495.

indicating that he who is unique should be pictured uniquely in one line; an inscription under the picture reads *Formatus Unicus una.* The line begins at the tip of the nose and continues in a spiral producing the picture solely by different degrees of shading.

Among the great masters who have painted pictures based on the Veronica story, we must not leave unmentioned the greatest and most famous painter of Spain, Murillo, who lived in the seventeenth century and has left us most valuable treasures of art, not the least among which are his Madonna pictures.

The most famous Veronica picture of a later day has been made by Gabriel Max who has succeeded in painting the eyes so that at close range they appear closed, but if viewed from a distance they seem to open with an expression of unspeakable sadness.

The type of the Veronica pictures is a characteristic expression

of a certain phase in the development of Christianity which exhibits a preference for an ascetic and severe, almost lugubrious,

VERONICA.
Engraved by Claude Mellan, 1601-1688.

conception of religion, and may be regarded as typical of the Middle Ages.

We recognize the serious spirit which found expression in this conception of Christ: it is an attempt to face boldly the horrors of the grave and thereby to overcome the fear of death. But we be-

SUDARIUM.
By Murillo, 1617-1682.

lieve that without losing the seriousness of life, we can triumph over death by recognizing its true character.

Death is not an enemy of man, but the bringer of peace. The

horrors of death are mostly imaginary, for death is simply the end of life, and so far as our sensations and psychical conditions are concerned, it is characterized by a ceasing of consciousness. Death

VERONICA.
By Gabriel Max.

therefore is no more terrible than falling asleep. The agonies of death, wherever they appear, do not properly belong to death but to

life. They are life's last attempts to maintain its functions, they are a struggle for self-preservation and are most noticeable in young persons. They are by no means essential or indispensable features of death itself, for on the contrary, on the appearance of death, all agonies cease. The obliteration of consciousness involves an obliteration of pain, and this is the reason why a dying person so often perceives the moment of death as a liberation or a passing to a better state. The subconscious nerves cease to ache and this relief from pain is felt as a deliverance from the ills of disease and all the troubles of life.

The spirit of Christianity has changed. It is now gradually yielding to a more serene, a more cheerful and more elevating view, laying little stress on contrition and penitence and utilizing the Christ ideal as a source of aspiration for the conduct of life.

The figure of Christ as it now lives in the hearts of most Christians is that of the compassionate redeemer who extends his hands towards those who need and seek help. So he stands before us in Thorwaldsen's grand statue, in which the present Christ-conception has found its truest, its noblest and perhaps most beautiful expression.

Garrucci, one of the leading Roman Catholic archæologists, states (*Stor.* III, 8) that the copy of the Veronica sudarium at Rome has faded so much that there is scarcely a shadow left on it to indicate that it had once been the picture of a human face. Let it be so: The God of evolution who makes all things new has gradually and almost imperceptibly changed our ideal of Christ. Artists imbued with a new spirit have represented the god-man in a new aspect which is more congenial to us and we need not regret the change.

CHARLES DE MEDICI.

BY ALBERT L. LEUBUSCHER.

SOME thirty-five years ago, the writer, while seated in a horse-car absorbed in reading a booklet entitled *The Art of Conversation,* was suddenly startled by hearing in a loud and dogmatic tone, "That is wrong!" Glancing up he encountered the brilliant gaze of a "phenomenon": a short man, with flowing locks, a large head, surmounted by a hat of enormous brim. He wore a long Prince Albert coat and a dark, flaring tie. "What is wrong?" ventured the interrupted one. "That title is wrong. Art concerns itself with *process.* Therefore the caption should be: 'The Art of *Conversing*'!"

The car was nearing our respective destinations, but in the few minutes that intervened before we parted, we had a "conversation" that I shall never forget. He got out at eighth street to go to Science Hall, the city's *rendez-vous* for liberals and radicals in religion and philosophy.

Some twenty years after this incident, in making a business call to secure some advertising I had observed in a magazine, I again found myself in the presence of Dr. Charles de Medici. The room I entered was filled with mathematical, chemical, and astronomical appliances. Paper crysanthemums and floral pictures on the left wall, veritable dust catchers, at once repelled; while the fresh and blooming flowers at the center table and in the window, charmed me. In front, at the right wall, surmounting a glass case filled with jars, were colossal busts of Plato and Socrates. Near these a life-size crayon of Dr. Charles de Medici looked down in meditative greeting. Next to this portrait was a half-life size engraving of Garibaldi, "looking enough to be a twin of his admirer." Numerous heads cut from magazines were pasted around this latter, heads of scientists and statesmen. The floor was strewn with books and papers.

I recognized the "phenomenon" of the vanished years. Business was forgotten; the new discovery in mathematics, "Commensuration," absorbed the attention, and the writer came away with a large book in paper covers, *Groundwork of Classification, an Abstract from the Commensurational System, with a Panorama of Evolution and an Exposition of Darwinism and Theology—conciliated,* by Chas. de Medici, New York, 1880; and a copy of part one of Section A of his *Rational Mathematics.*

Five or more years afterwards, seeing an account in a local paper of a mathematical genius who had established a studio at the Mercantile Library building, and had sent out a challenge to the world to call and disprove his mathematical discoveries or be converted,—the writer again called, found his erstwhile friend, but found him neglected by the "world." Then was formed a friendship that proved to be of intellectual and pecuniary advantage to both as the years rolled on.

On May 31, 1903, Dr. Charles de Medici "passed out," in abject poverty, broken-hearted, and deserted by all except his devoted wife and faithful physician. Within a few months of his end,—owing to unmerited indignity at his hands, occasioned, in a measure, by the nervous irritation of an enfeebled system and by the lees of bitter disappointment,—even the writer had temporarily deserted him, not realizing the nearness of his end. But with his expiring breath and filming eyes he still referred to the acclaim and radiant joy with which his discoveries would one day be greeted by a once indifferent world.

Dr. Charles de Medici is a lineal descendent of Lorenzo de Medici, the Prince of Florence, surnamed "The Magnificent." He was born at Copenhagen, Denmark, in 1828, and was educated at the university of his native city. Before he was twenty-one he was a revolutionist and political agitator. His family, being aristocrats, came to regard him as a really dangerous lunatic, but he managed to escape their vigilance, and went to Germany, and then to St. Petersburg, where he acquired the English language, which he learned to speak and write with great fluency. From St. Petersburg he drifted to East India, and entered the service of the East India Company as surgeon. When gold was discovered in the fifties in Australia he went there for adventure, not for wealth. After a short experience at Ballarat and Bendigo, he returned to his native place, Copenhagen. From there he went to Chicago, where he practiced medicine until burned out by the Chicago fire. Then he drifted to Boston, where, he says, he found so many cranks to the

square inch, that he felt there was no place or room for him; and he decided to try New York City, which became his permanent abiding place.

In 1894 he attracted the attention of the daily press, which gave several lengthy interviews with him concerning his scientific discoveries and educational devices. One periodical described him as "unquestionably one of the most interesting and picturesque per-

DE MEDICI'S MONTHEON.

sonalities of New York." The *New York Press* of May 19, 1894, had a lengthy illustrated interview with him, in which it says, "he claims that discoveries, which he has made, will mark an epoch in the science of mathematics, just as did the discoveries of Aristotle, of Pythagoras, of Euclid, of Legendre. 'I do not anticipate that my discoveries will be appreciated during my life-time,' said Dr.

de Medici to me yesterday (and he spoke cheerfully, as if to say, I should continue my researches even if I knew I should never realize for a moment the result of anything I have done)—'but I have so arranged everything, and so planned everything, that all of my discoveries can be availed of posthumously. My papers, my charts, my plans, my work, will be found in perfect order at the time of my death.' "

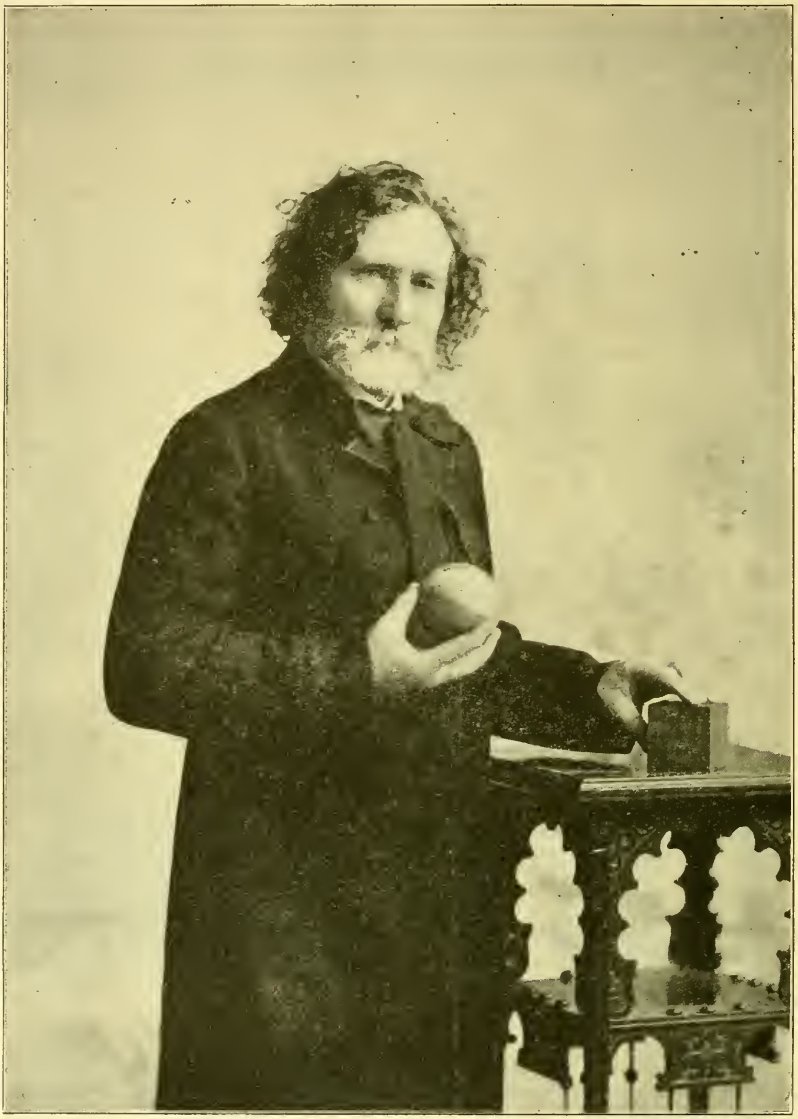
"Here," said Dr. de Medici, "is the monument which I wish placed on my grave when I am gone," and he produced a lot of blocks, with which he proceeded to build the monument, the photograph of which is here reproduced. "All I ask my friends, when I am gone, is that they shall see that this monument is erected above my dust."

This monument, in its various sections and relations, represents the geometrical discoveries claimed by Dr. Charles de Medici. He has discovered, as he elsewhere demonstrates, an exact metric system, doing away with the "infinitesimal indefiniteness" of Legendre's logarithms, which he declares to be decidedly *"finitesimal"* when applied in practice. He has discovered "the Surd law" and "Commensurational Arithmetic," which involve the squaring of the circle and the cubing of the sphere; and as a result of these discoveries, he has "constructed instruments that will revolutionize, perfect, and make exact, navigation and the investigation of the student of astronomy."

In the *Phrenological Journal* for November 1894, there is a fine characteristic portrait of the Doctor, with a short sketch by the editor, who knew him. The editor says that Dr. de Medici "is a delightful companion, generous, happy, winsome, healthy, buoyant, and enthusiastic. He is very modest, and though frank and open in communicating his opinions to appreciative listeners, he is remarkably free from obtrusiveness. The portrait shows a remarkable length of brain forward from the ears. The frontal lobes are exceedingly symmetrical as well as capacious. His expression in conversation is benign, genial and radiant with kindliness and good humor."

Another periodical described him as follows: "Personally, Dr. de Medici is one of the most delightful of individuals. . . . Although a sexagenarian, his cheeks are as plump and rosy as a school-boy's, his eye gleams with the light of youth and enthusiasm, and every movement denotes agility and health. He is best described by saying that his face is full of sunshine, and he looks like an innocent and happy countryman, honest himself, and not dreaming of deceit

in others. That this winsome, boylike man has made and sunk fortunes; that he has studied hard for forty years in the development



CHARLES DE MEDICI.

of his abstruse science, that he has wrestled with leaders of thought in many lands and languages, is not at all strange....And the

childishness reflects not the intellect, but the purity and truth and loveliness of a great nature, whose highest aspiration is to benefit mankind."

I am unable, just at present, to gain access to Dr. de Medici's private papers, unpublished manuscripts, and scrap-books. When these are examined several gaps in his biography will doubtless be supplied. Among these gaps is his activity, in the early seventies, for Mrs. Elizabeth Thompson, the philanthropist, as secretary. During this period was projected "The Harvest Home of Genius,"—his arguments in favor of which, and its constitution and by-laws, also the statement he made concerning the Montheon Society which he then organized, and its plan and prospectus, which he drew,—make very interesting reading, and should form a separate chapter in this story of his career and works. Mrs. Elizabeth Thompson unfortunately for the success of these enterprises, lost her fortune, and died before any of Dr. de Medici's plans could be realized.

What a singular irony of fate do these documents now exhibit in the light of subsequent events! That the real conceiver of the "Carnegie Institution"—a genius *par excellence,* meriting a pension from its fund if any human being ever merited one,—that he should be turned away from its doors when he knocked for admittance; that he should be ignored and left to die in obscurity and poverty, broken in spirit by frustrated hope and the neglect of the world, is a tragedy for history to contemplate, is indeed its author's most cogent argument for a *real* "Harvest Home of Genius."

Mrs. de Medici informs me that a copy of this document concerning the "Harvest Home of Genius" was sent to Mr. Andrew Carnegie by messenger; and Dr. de Medici on several occasions claimed to the writer that Mr. Carnegie had derived his idea for his "Institution" from this very conception of the "Harvest Home of Genius."

Shortly after the opening of the Carnegie Institution the writer presented the claims of Dr. Charles de Medici for a grant that would enable him to exploit his great, epoch-making discoveries. A number of letters were exchanged, when the writer was invited to forward a set of the Doctor's writings. This was done, accompanied by a brief statement, prepared by the Doctor, of his discoveries; his educational devices and toys; his Panometer for the use of astronomers; his "Metrometer"; his carefully-elaborated set of models of weights and measures based on universal metrology, etc., etc.

About six months later I received a printed "circular letter" to

the effect that Dr. de Medici's claim for a grant could not be considered inasmuch as there were too many applicants for subsidies, etc. I at once retorted with an emphatic protest at such an unconcerned dismissal of the Doctor's transcendent claims, a dismissal without consideration or examination, and stated that if these claims were honestly examined by capable and broadminded mathematicians I had no fear whatever of the result; but that since the usual run of mathematicians had shut the door of their minds in the face of such claims as those made by Dr. de Medici, it were well for the committee to seek for a competent mathematician, *one that would not prejudge these claims,* but would give them a genuine examination; and I accompanied this suggestion with a further allusion to the nature of these claims, in a paragraph or two. The reply to this protest was that President Gilman would himself look into these claims; but that it was desirable to have the Doctor prepare a resumé of his discoveries. Notwithstanding that a full set of the Doctor's books and leaflets had been sent them, as well as an outline of his claims, the Doctor readily assented, and worked at the resumé during the summer months after a long spell of illness which had left him greatly debilitated.

On the completion of his resumé he prepared to go to Washington, to demonstrate his system in person, fearing that President Gilman would not tackle the problem in the right way, judging from the uniform experience he had had with mathematicians like Edwards, Chase, and others.

The Doctor made many sacrifices to secure enough money to fit himself out, but after he was all ready, his debility was such that he had to abandon all hope, and in despair he lay down and died of a broken heart. The archives of the Carnegie Institution still preserves the literature of Dr. Charles de Medici; and no word has ever been received from it since the date of their last letter to me, to which I have referred.

It was early in 1894, I think, that Dr. de Medici retired from business to devote his energies to establishing his discoveries, educational devices, and inventions. He had then a snug fortune, realized from a business enterprise. On retiring he proceeded to sink his money in the composition and plating of his books and diagrams; in the production of his educational devices, toys, models for weights and measures (founded on universal metrology); and on his various inventions. He also made an attempt to revive an interest in his project for the "Harvest Home of Genius" and in the "Montheon School." His efforts in behalf of these, it seems, were premature.

So were also his public challenges concerning his mathematical discoveries.

Dr. de Medici's actual publications, outside of his mathematical books are few. There are, however, a number of unpublished manuscripts, one of them a work of fiction. The earliest literary work of his that I have been able to trace is a pamphlet entitled *Humanity*. This seems to have been followed by *Groundwork of Classification* (the full title of which is given above). It is a thin paperbound book, 9½×12 inches, evidently a crude adumbration of a large work the Doctor had projected, and seems to have been composed at a much earlier period. It evinces more original thought than extensive reading on the great problems of science, metaphysics and philosophy. Had not his attention been preoccupied with his mathematical discoveries and educational devices, he would probably have elaborated the line of thought he had projected in this treatise. As it is, I doubt greatly that he did any systematic work in this direction, though I recall finding him at work on one occasion, on an essay on "*Chaos and Cosmos,*" which he treats in this book.

Both of these early works are out of print, only one copy of *Humanity* is known to be in existence; of *Groundwork of Classification* possibly a dozen copies are among his effects.

The Two Lunatics is an ironical and humorous skit, satirizing certain lines of philosophic thought and certain inequities involved in our social and economic immaturity. Several hundred copies of this, in paper covers, remain undisposed of.

He continued to write a little after the publication of his mathematical system; and he wrote more before,—so there are probably a number of manuscripts, some of which may be of value.

After the publication of his *New Geometry* he devoted his attention to the perfection of his system, by having physical models made to illustrate its principles. During his last ten years he devoted some of his time to the construction of mathematical charts, diagrams and tables.

Like most innovators, Dr. de Medici acted on the supposition that he was an irresistible force, and did not, in consequence, realize until too late, that the stubborn stability of inertia constituted an immovable body in his path. When he issued the first two sections (A and B) of *Rational Mathematics* in parts, he confidently anticipated their immediate adoption by the schools of the country. He put a very low price on them, and sent a large number of samples of the first two parts to teachers of mathematics all over the United

States. The answer was Silence unbroken and deepening as the days came and went.

Of Part 1 of Section A only a few copies remain. Of the other parts, and of Section B there are quite a number of copies on hand. Of Section C, devoted to the "Surd Law" and "Commensurational Arithmetic," there are only two or three sets of *page proofs* of two out of the five parts projected. The other three parts positively exist in manuscript, and include the tables and diagrams on which he had worked up to the year before his death. He declared a number of times in his last days, that the mathematical work he had projected was completed.

There are, I understand, plates for everything mathematical published, and these plates require but very few corrections.

The Doctor bemoaned the fact, many times, that he could not get the dyed-in-the-wool mathematician to use a ruler and compass, and to disuse the decimal notation and logarithms. They would persist in judging his radical discoveries by methods that were acknowledged to be false. They would also persist in considering isolated problems here and there, and would not take the trouble to examine his system in detail or as a whole. Whenever mathematicians consulted him personally, however, which occasionally happened; and when they, in his presence made use of the ruler and compass, they invariably found the exposition of problems, as given in his booklets, intelligible, definitive, and convincing. They then saw that the understanding of that exposition was contingent upon the progressive construction of diagrams, which he had urged upon the student with tireless persistence. And it was also seen that his occasional departure from the usual definitions and terminology was largely due to, or in keeping with, his unique discovery, method, and results, and not because he was ignorant of the literature of the subject, for few had a more extensive knowledge of that literature than he.

Dr. de Medici made no attack on any "accredited body of doctrines." He was concerned solely with unconfirmed resolutions, with moot questions, with open problems, the solution of which involved at least two practical results of the utmost importance: (1) "commensurational arithmetic"; and (2) the possible construction hereafter of "mathematically" exact (instead of, as now, merely approximately exact) instruments in many lines of science and art, especially in astronomy, surveying, architecture, engineering, and mechanics.

It has seemed to me at times that the Doctor would have got

a better hearing had he presented his unique discoveries in magazine articles, or in an advanced treatise addressed to mathematicians, and had not attempted to obtrude elementary school treatises, containing radical innovations, upon the attention of educators. Had he pursued this course he would doubtless have brought on a discussion, with the inevitable result of the acceptance of the discoveries, by some noted professors, which acceptance would have given the system prestige. In the form in which they were published, however, educators and mathematicians ignored these elementary treatises that were sent to them, which treatises, "unbeknownst" to them, contained some gems of inestimable value.

I cannot better conclude this cursory sketch of the career and claims of an unknown but remarkable genius, than by presenting the reader with the following lucubration written by him on the advent of his transcendent

DISCOVERY OF THE TRUE PI-VALUE.

The city was wrapped in quiet. Prude citizens slumbered in the embrace of night. The finger of a clock pointed to 6; and the wintry morn of the 8th of January, 1881, longed to be unfolded from its twilight shroud, so it could pose in modest robe of dawn. Awake, alone, and in silence, a worker, absorbed in depths of thought, transfixedly gazed on a few figures which among many others stood out in bold relief, breathing, as it were, secrets of the mystic shrine.

More and more these figures appeared alive; and more and more forcibly were the numbers 4 and 5 impressed. Then recollections of 2, 8, and 9 swept through the agitated brain, and the fraction sought for more than two thousand years was found at last. Like a luminous star the discovery lit up the clouded record of mathematical research and spread joy in the mind of the man who first was permitted to break the seal and use the key which God alone had used before.

But, "Can it be true?" Perhaps it is but a wild fantasy born of a too zealous desire to succeed....A dizzy reel; then a chilling tremor of emotions crept through the frame of the man and flushed the cheeks with a crimson blush, the blush of departing hope. A sickly smile of growing doubt cast shadows where just before the mien was heaven lit.

How could one mortal hope to have found in labyrinthic maze the way to link knowledge divine to human understanding, while countless authorities, high and low, proclaimed such a find impossible. Yet, the humble worker's mind was stirred by God-like faith, and boldly he strove to convince himself that he was but an instrument made fit, by accident or by design, of Jehovah's will to act as mediator between sophistry and science.

Thus the night passed in hope and fear, and the early dawn found the discoverer of perfect "pi" transported into dreams in which he saw the glory and felt the bliss of sublime victory.

THE TRAGEDY OF A LONELY THINKER.

BY THE EDITOR.

DURING the Columbian Exposition at Chicago the President of the Exhibition Committee was greatly pestered with visits of inventors who had been unsuccessful in practical life and who hoped now to find an opportunity to have their contrivances brought before the public. A goodly percentage of them were circle-squarers, and experience proved that when once admitted it was very difficult to get rid of them. Whenever they were met with the proposition that their undertaking was Utopian or chimerical, they had so many arguments ready to refute their opponent and were possessed of such unusually glib tongues that finally they were refused a hearing. They were told that he, the President, had no time to consider their claims;—they would have to procure the endorsement of some scholar or mathematician known in Chicago and I was unfortunate enough to have my name mentioned in this connection. The result was that I had the equivocal honor of being visited by almost a dozen circle-squarers, and two or three inventors of a *perpetuum mobile*. I got rid of them as well as I could; the employees in the office had sometimes to bear the brunt of their attacks and kept them out. Once I remember Mr. McCormack, at that time my assistant, argued with one of them for half an hour or more and showed him in Schubert's essay on the subject that his particular solution, or better his mistaken notion of the subject, had been anticipated more than a century before by some one else—a fact which for a while puzzled him greatly, but being conscious of having squared the circle without any knowledge of his predecessors, it did not disturb him much.

The majority of these men were not mathematicians at all, but on the contrary were most densely ignorant as to the very nature and significance of geometry. Some even boasted of their ignorance and like St. Paul gloried in the thought that God had chosen to

reveal the deepest wisdom of science through the instrumentality not of sages, but of an unschooled and uneducated mind, so that the praise were His alone. But some circle-squarers were talented persons, intelligent and even ingenious. All of them were enthusiastic and idealistic and not a few of an imposing character. I feel sure that every one of them would have been interesting to the psychologist; at any rate those whom I had the opportunity to diagnose were not lacking in fine and noble qualities, but they were pathological without exception, and I could easily foresee the tragic fate which awaited them—disappointment after disappointment, until they would die in despair.

The case of a circle-squarer is necessarily pathological and his condition is that of an intellectual disease the cause of which may be different in different individuals, but as a rule it is the ambition to accomplish something quite original, something which no one else has ever done; to solve a problem which has puzzled the best minds; to think a thought which it is impossible to fathom by ordinary means, in short to become the channel of a new revelation. The aim is noble enough, but the person who possesses it, lacks the necessary patience to equip himself for the task, to become familiar with the conditions from which he starts and to furnish the thing which is really wanted. He fabricates the article first and cares little about the demand. He performs his task without inquiring into the need for it. He begins with the assumption that he is the chosen channel of divine grace and buoyed up by this confidence, he does not take the trouble to study, to learn, to investigate. He expects the world to see the solution from his standpoint and to recognize him as the medium of a revelation. He may be very modest in his behavior, but the core of his heart is filled with vanity and a cure of the disease would be possible only by plucking out from his soul the conceit that has led him to imagine that he has really accomplished something great. The medicine is bitter, for it must necessarily blast his dearest hopes. In many instances a cure would be a positive cruelty, for the illusion that one is a genius of unique significance is a sweet dream, and the awakening from it is extremely painful.

Under the impression of several cases of this kind I wrote at that time a short story—a tragedy—entitled "The Circle-Squarer," which was published in *The Open Court* (Vol. VIII, pp. 4121, 4130), and I have retained a deep sympathy with this unhappy type of persons. Most of them are men of an ideal cast of mind and of a noble and highstrung temperament. My interest was newly awak-

ened when Mr. Leubuscher made me acquainted with the fate and writings of his unfortunate friend Dr. Charles de Medici, who after a life of various adventures had to suffer great disappointment and died finally of a broken heart, though undaunted in the confidence that he bequeathed to the world an invaluable discovery.

De Medici must have been a fine type of a man and it seems a pity that he wasted his life in the vain pursuit of an *ignis fatuus.* He appears to have been better equipped with mathematical knowledge than any one of his confreres, the other circle-squarers I have met, but his knowledge was not sufficient to save him from the fatal conviction that he had squared the circle.

It is a truth well understood by all mathematically trained minds, that the relations between certain magnitudes cannot be expressed in whole numbers; in other words they are incommensurable. Such is the proportion between the circumference of the circle and its diameter which has been called π, the initial letter of the Greek term *periphery.* The number π is important for many purposes, especially for the calculation of any circle, or cycle, or circuit, or circumference of which the radius is known, and it has been approximated with more or less accuracy, acording to the conditions, from $\frac{7}{2}$ to a calculation of a decimal fraction of more than three hundred figures. Mathematicians have always suspected that the number π belonged to the realm of incommensurables, but only about thirty years ago has Professor Ferdinand Lindemann, of Munich, succeeded in proving that since π is equivalent to an infinite series it can never be expressed in a proportion of whole numbers. This settled the question permanently in the domain of mathematics, and the burden of proof would rest with any one who might claim that the circle can be squared, for he would have to go over Lindemann's calculations and show wherein their error lies.*

De Medici's books contain many thoughtful suggestions, but he has never taken the trouble to post himself on the problem which he ventured to discuss. He expects the rest of the world to adapt themselves to his method and dispense with incommensurability, thereby squaring the circle in a short cut that to the ordinary mathematician would represent an approximation, presumably sufficient, to be sure, for almost all practical purposes.

Mr. Leubuscher, the enthusiastic friend of Dr. de Medici, was

* The reader will find a popular discussion of the subject in Dr. Hermann Schubert's paper entitled "The Squaring of the Circle," published in *The Monist,* Vol. 1, p. 197, and republished in his book *Mathematical Essays and Recreations,* Chicago: The Open Court Publishing Company. See also "The Circle-Squarer," above referred to.

anxious to have the case reopened and I was willing to have the claim of de Medici's "Rational Mathematics" inquired into. But the work of entering into the details of the merits and demerits of the case takes more time than I can spend on it; so I handed the case over to Mr. Francis C. Russell of Chicago, who has busied himself much with kindred subjects and has a liking for the recondite problems of the most abstract thought, such as algebra of logic and the logic of relatives. He has deposited his verdict in an article which appeared in the November number of *The Open Court* under the title "Minos and Niemand Again," and Miss Lydia G. Robinson has extracted a number of passages from an anonymous book of Dr. de Medici which in grim sarcasm he entitled *Two Lunatics, A Remarkable Story by One of Them.* This publication is a truly pathetic presentation of the story of this misguided genius and his many tribulations. It is a diagnosis of the case of a patient by self-introspection and describes the several situations in bitter satire—a satire both of himself and of a heartless world with its Pharisaic self-sufficiency. He feels that the world condemns him as a "lunatic" and he has the firm conviction that among all these multitudes who reject his solution his is the only sane mind. He hoped and waited but his chance did not come. He planned an institution which would provide the means for the repudiated genius to work out his valuable thoughts, and when the Carnegie Institution was founded his expectations were raised to a high pitch, only to be disappointed again. I have no question that President Gilman had his claims conscientiously investigated by competent men, but he was too courteous to state the result of their inquiry in blunt language. It was sufficient to let him know that there was no room for him in the Carnegie Institution.

It is a forlorn cause which Mr. Leubuscher defends, and yet I do not believe that the claim of his late friend should be suppressed. Let the world know what Dr. de Medici has done, how he aspired for a high aim—too high for him to attain; how he failed; how he struggled for recognition; how he was disappointed again and again, until he died impoverished and desolate. His life is a tragedy, but his books are preserved. Mr. Leubuscher who stood by his friend in times of dire necessity has acquired them and is eager to have their existence made known. They are interesting in spite of the failure of their author to understand the problem to the solution of which he devoted his life.

We publish elsewhere in this number all those passages of Mr. Leubuscher's article which refer to the personality of Dr. de Medici.

We have dropped, however, those portions which he probably deems most essential; expositions of the mathematical work of de Medici, the greatest part being quotations from his books and articles. We believe that those of our readers who would take sufficient interest in the subject to enter into Dr. de Medici's argument themselves, could easily procure his books which Mr. Leubuscher has for sale. These include Sections A, B, and C of *Rational Mathematics,* of which Sections A and B treat of geometry and Section C of arithmetic, beginning in Part I with "Commensurational Arithmetic," followed in Part II by de Medici's treatment of the "Surd Law." The *Two Lunatics* is also on hand in paper covers and there are many loose sheets and pamphlets on de Medici's favorite topics such as "Metrology and the Metrometer," "The Harvest Home of Genius," "The Solving Triangle and Protractor, an Instrument which Squares the Circle, Cubes the Sphere, and Rectifies the Curve," and the "Montheon Society." Mr. Leubuscher may be addressed in the interest of these publications at 50 Butler Street, Brooklyn, N. Y.

I myself have attempted to describe the adventures of a circle-squarer and utilized much material of my own experience, but here is a case of actual life, full of the pathetic experiences of a real man which might furnish material for an able novel writer to work out the sad tale of the destiny of an ideal self-delusion.

And why is Dr. de Medici's experience so pathetic? Because his is by no means an isolated case. The same hankering after the vainglory of the extraordinary slumbers in every one of us, and this tendency is not wrong in itself. The aspiration to accomplish something unusual and great has produced many heroes and leaders of mankind, and not a few of them have suffered martyrdom for their cause. But the circle-squarer's ambition is warped either by an excess of self-confidence or a lack of intellectual strength. The tragic element comes in when we consider that a small fault, situated however, at the core of a man's soul in his wrong estimate of his own capabilities, leads him to the path of certain failure.

In the circle-squarer we find the most typical case of a disease which in a more or less virulent form can be observed in almost every human being. It is the disease of self-opinionatedness, naturally arising from a too good opinion of oneself and an undervaluation of the rest of the world. It is the disease of an oversubjectivity; it originates most easily in those people who are not capable of reaching their verdicts and conclusions on the ground of objective considerations. Such people are the children of their moods; they scorn the lesson of outside facts for they are unable to see the details of

the surrounding world in their objective significance. They are too busy with the facts of their own sentiments and can never dissociate the two. Therefore they are mostly sentimentalists, subjectivists, idealists, or (to use the latest euphemism) pragmatists. They live in a world of their own and have to learn by long sufferings that their truth, their notions of life, their conception of reality, does not agree with the actual world. Some learn it in time, some too late in life to mend, and some die with their illusions and dream that they are the martyrs of a new covenant, and that they have been the prophets of a new world in which the circle will be squared and the miseries of the old dispensation will therewith be done away for ever.

THE RUNNING-GEAR OF THE DOG'S RACING-MACHINE.

BY WOODS HUTCHINSON, M. D.

JUST a word or two as to the couplings and running gear, by which the dog's levers are fastened together, in the racing machine. You thought they were just "jointed on to his body?" Certainly they are, but they have had much to do with moulding the shape of his body, and indeed if you will look at this skeleton, or bony "core," of the dog you will see that a large part of it is simply a series of rods and girdles, for binding his racing-levers together properly.

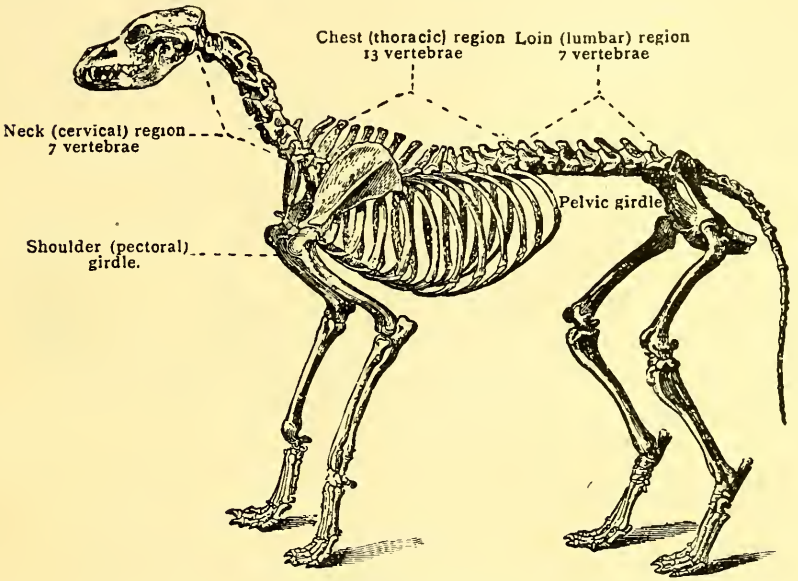
It is a frame-work which is put together very much on the plan of an ordinary farm- or express-wagon. In the place of the wheels you have the four legs, which indeed as we have seen swing backward and forward, just like the spokes of a wheel which would roll half way round and then back again constantly. Each pair of these spokes is jointed on to an "axle" at the "hub" or shoulder-joint, only the "axle," instead of being a straight bar, is a hoop or complete circle and, instead of running through the "hubs," is hollowed out on each side into sockets, into which the spokes run and play.

If you were to take the box off a toy-wagon and run a bar across the tops of the standards, or uprights, on the axles, you would have a "square circle," to the lower corners of which the wheels were attached. Turn that square into a circle and drop it down between the wheels, so that the hubs are attached nearly half way up its sides, and you would have a fair, rough imitation of the skeleton-plan of an animal.

Each pair of legs is attached to a circle of bones running right round the body, known as the "shoulder-girdle" and the "hip-girdle," and the body and its contents are slung inside them and

carried just as the wagon-box and its load of corn, we will say, are carried inside the axle, the standards and the bar across the top of them.

Now how are front axle and standards of the wagon and its hind ones held together? By a coupling-rod or bar, of course, which runs under the bed of the box from one axle to the other. The dog's running gear is held together by a similar rod, only instead of running along *below* the wagon-box and load, it runs above them and they are slung from it, like a hammock from a ridge-pole, instead of resting entirely upon the axles.



SKELETON OF THE DOG.

After Strangeway. Showing regions of the back-bone, and shoulder- and hip-girdles.

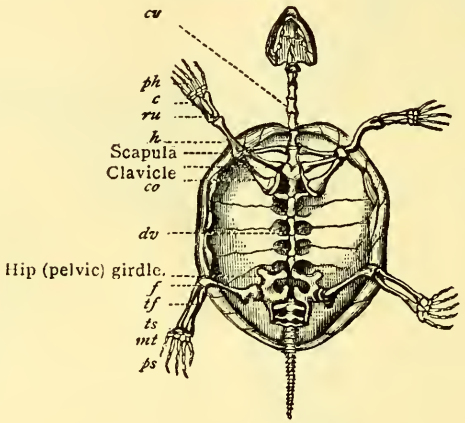
This brings the "coupling-rod" on the upper surface of the dog's body along his back, and hence we call it the "back-bone." And to complete our racing-frame, the back-bone runs forward, from above the front axles, out to the head, which uses it to steer the racing-machine just as your hand uses the handle or "tongue" of the toy-wagon to steer it.

Now let us look for a moment at the back-bone or tie-rod. At first sight it looks almost as if it were all in one piece, from head to tail, but on looking closer you will easily see that it is made up of a large number of short bones or sections about three-quarters

of an inch long. You may count them if you like and will find seven in the neck, thirteen in the chest length, seven in the small of the back, three between the "uprights" of the hip-girdle and from seventeen to twenty-two in the tail.

Now why should the rod be divided into such tiny pieces, like one of these toy-snakes of wood and string which wriggle so alarmingly? To permit movement of course, and if you will look again at the sections in each division of the back, you will find that wherever the movement is greatest the little sections are most distinct and most loosely bound.

In the neck, which has to move a great deal they are quite loose and movable one upon the other. In the chest-region they are



SKELETON OF A TURTLE.

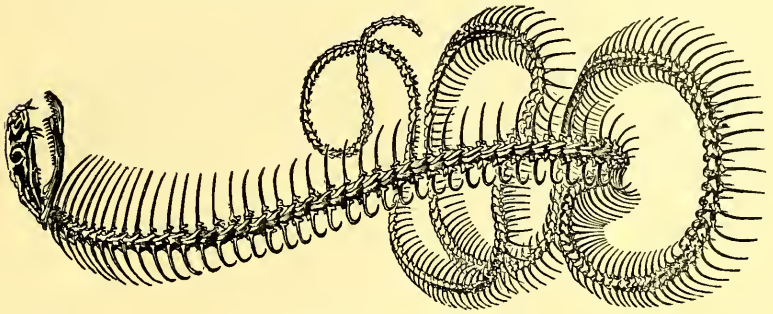
cv, cervical vertebrae; *ph,* phalanges; *c,* carpus; *ru,* radius and ulna; *h,* humerus; *co,* coracoid bone; *dv,* dorsal vertebrae; *p,* pelvis; *f,* femur; *tf,* tibia and fibula; *ts,* trasus; *mt,* metatarsus; *ps,* phalanges.

closely packed together and so locked into each other by little spurs and overlapping spikes that the rod can hardly be bent at all. In the small of the back which arches up and down when the dog runs, the little bones move easily upon one another, but between the broad hips of the hip-girdle they have actually glued themselves together, and the four become one bone, with only little ridges across it to show where the divisions used to be.

In the tail they are much longer and slenderer and each moves very slightly upon the next except at the base where the chief movement is in wagging, etc., and they glide past each other quite freely. And because being made up of these little separate bones allows the back-bone to turn or bend, they are called by the clumsy Latin name

of *vertebrae,* from *vertere,* "to turn," (*version, vers*atile, di*vert,* etc.) and the string of them is known as the *vertebral column.*

This vertebral column has, however, another use besides acting as stiffening-rod to the racing-machine. In this mounted skeleton you see the vertebrae are all strung together upon a wire, which runs through a rather large hole in each of them, like beads on a string. In the tube formed by all these rings runs the spinal cord, or great telegraph cable, running from the brain clear to the root of the tail and giving off branches to supply the body between each pair of vertebrae, throughout the whole length. At the head-end this bony but flexible tube expands into the brain-box or *cranial* portion of the skull and at the end of the hip-girdle it disappears entirely so that the vertebrae of the tail have no opening through them, but are simply solid little "fingers" of bone.



SKELETON OF THE COBRA.
Notice that all vertebrae bear ribs except those of the tail.

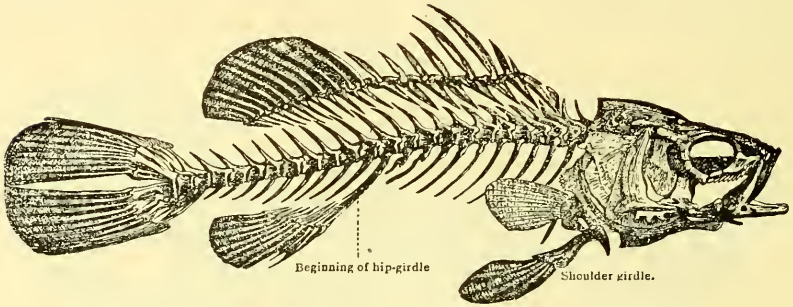
So important a structure is this hollow rod, first for stiffening and afterwards for protection of the nerve-cable and batteries, that its presence or absence has been made to divide all animals into two great classes, the "Back-boned" and the "Back-boneless" or *Vertebrates* and *Invertebrates* (*In* meaning "not" in Latin). Fishes, frogs, snakes, birds and warm-blooded animals of all sorts are vertebrates; jelly-fish, starsfish, oysters, lobsters, worms and insects are invertebrates.

You can break or cut any of them right across and not find a trace of back-bone running through them. But though lobsters, worms and insects have no back-bone, you will find one thing about them which curiously resembles the jointed rod of higher animals. And that is that their entire bodies are made up of rings or *segments* one behind the other just like the dog's vertebral column. You can count from fifty to a hundred and fifty in a worm, fewer in a lobster

or crayfish, but even more distinct, and still fewer in an insect unless it be a "Hundred-legger." On the hind-body of the grasshopper or the bee, for instance, the rings can be easily counted. Most back-boneless animals which move rapidly get their body-stiffening by hardening these outside rings, instead of a central core. The lobster for instance hardens his with lime salts and makes his "shell," the grasshopper with a horny substance called *chitin.*

Still more curiously, each of these rings has a tendency to sprout something in the way of legs, bristles in the worm, claws and swimmerets in the lobster and real legs in the bees and spiders.

In the original back-bone each segment carried a pair of ribs, as now in the fish and snake, and in the chest-region of the bird and dog.



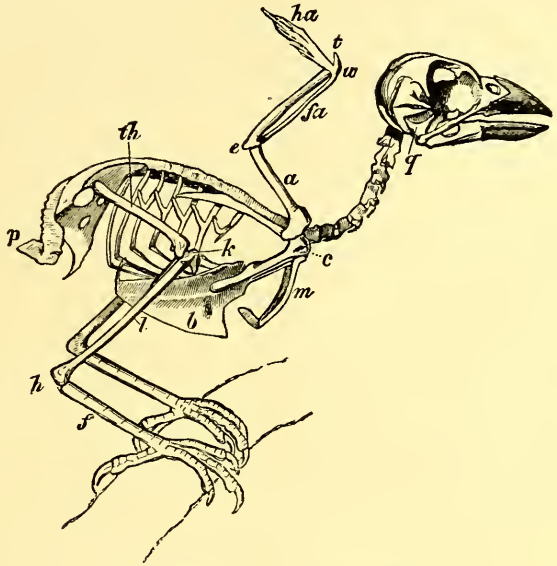
SKELETON OF A SEA-PERCH.

There is a strong tendency for all sorts of animal bodies to grow in segments or successive rings and a deeper reason for the many pieces in the dog's back-bone than mere flexibility. The back-bone is literally the central stem or "key-stone" of the vertebrate skeleton, and if you will compare these skeletons of the fish, the snake, the bird, the dog with this stiffening-rod as the basis of them, you will be surprised to find how closely alike they really are at bottom.

All of them have the jointed rod running the whole length of the body and tapering off more or less gradually in the tail. A canal for the spinal cord or nerve-cable runs through the rod near its upper surface in all, becoming an open groove toward the rear of the body and disappearing in the tail. If you take the rod to pieces you will find that this "upper" position of the canal makes each of the pieces or *vertebrae* consist of a rounded lozenge below, the *body,* and a ring above, the *arch,* with little handles or *transverse processes* on each side, for the attachment of muscles and

smaller spurs standing out from its front and hind surfaces to lock the bones of the rod together. From the top of the ring runs out a spike of bone called the *spine,* which often slopes backward, and the successive ends of which you can easily feel in the dog's or your own back like a string of beads under the skin.

The vertebrae carry ribs the entire length of the rod except the tail in the fish and snake, but only in the chest region in the bird and dog. All of them except the snake have a front- or shoulder-girdle and a hind- or hip-girdle of two to four bones, to which a



SKELETON OF THE SPARROW.

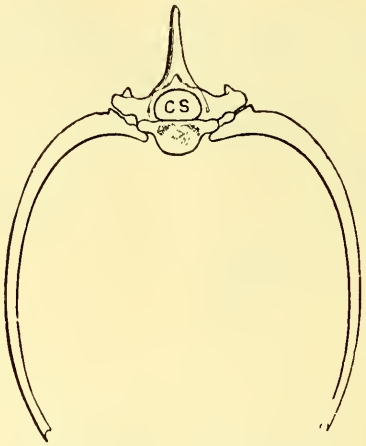
After Holder. *b,* breast-bone; *m,* merry-thought or collar-bone; *c,* coracoid bone, over which the tendon works to pull up the wing; *p,* plowshare-bone, on which the tail grows. Wing-bones: *a,* upper arm; *e,* elbow; *fa,* fore-arm; *w,* wrist; *t,* thumb; *ha,* hand. Leg-bones: *th,* thigh-bone; *k, l,* lower part of leg; *h,* heel; *f,* foot.

pair of hands are attached, known as fins, wings and feet respectively. In the fish the hand is joined directly on to the girdle and there is only one joint, the wrist. In all the others the hand has grown out a fore-arm and arm from the body with two more joints, elbow and shoulder, between it and the girdle.

In all, the shoulder-girdle is made up of two, longish, flat sabre-shaped *blade-bones* or *scapulae* (Latin for "spades") and is filled in by muscle above on each side of the back-bone, while in most of the warm-blooded animals there is another pair of bones below,

the *clavicles* or "collar-bones," which you can feel quite plainly at the upper part of your own chest, running across from the neck to the shoulder, although they have almost disappeared in the dog.

In the bird these *clavicles* grow together in front and form the *wish-bone* or "merry-thought," and because of the tremendous strain upon this girdle, due to its bearing the wings, it is strengthened in front by a second pair of bones below and much thicker than the collar-bones, called by carvers at table the "side-bones" and by uncomfortably wise men the "coracoids" from a long Greek word meaning "crow-like," on account of their alleged resemblance to a crow's beak. Your father can show them to you the next time you have roast chicken or turkey for dinner, but I am afraid you won't think them much like a crow's beak, so you may just remember them as "side-bones."



A VERTEBRA AND A PAIR OF RIBS.
After Holder. *cs,* cavity containing cerebro-spinal cord.

In the fish the hip-girdle is imperfect, only forming about a third of a circle below, and in some kinds is pushed forward in a curious fashion, close up to the shoulder-girdle, but in both the bird and the dog it is made up of two strong, broad, curved plates of bone firmly fastened to the back-bone above and coming toward one another in the middle line below, thus encircling a round space, like a basin without any bottom, from which the girdle is named the *pelvis* (Latin for "basin").

You can feel the upper edge or rim of this basin in your own body as the hips or hip-bones, upon which you are told *not* to rest your hands when you stand and talk in public. The sides of the

basin do not meet in front or below in the bird, for a reason which we shall talk about later, but come together firmly in the dog and all other four-footed animals, as well as ourselves.

And if you will just recollect the parts taken by the front and hind legs of the dog in running, you will soon be able to reason out why the girdle belonging to the front-legs is so light and loosely hung to the back-bone, to prevent jarring when they "prop" the body at full speed, while that belonging to the hind-legs is so heavy and firmly joined to the back-bone and welded in front to give firm attachments for the forward drive of the real propellers. In ourselves it is heavier and solider still because it has both to propel and bear the entire weight of the body as well.

I have said more about the skeleton than I at first intended, because if you look at it under the popular impression that because it is the hardest and most lasting part of the body, apparently giving it its shape, and is so much alike in all different kinds of animals, so "constant" as the wise men say, it is therefore the *foundation* of the entire body, upon which all its other structures have been moulded, you will not only make a great mistake, but also find it the hardest thing in the body to understand properly.

If, however, you can get clearly into your minds—though here some of the wise men would not agree with me—that with the partial exception of the head, *the movements of the dog's body have built his skeleton, as it was wanted, and each bone of it where it was wanted to carry them out properly,* you will have a key by which you can explain and understand, not only his skeleton but that of any other back-boned animal.

Every bone has a meaning and a reason for both its existence and its shape, which you can find out for yourselves, if you will only study it in this light. The skeleton was not laid down first and then the food canal, heart-pump, etc., tucked inside it and the muscles laid on over it, until a nice rounded body shape was filled out, but the food-tube came first, then the muscles to move it about after something to eat, and the muscles built the skeleton bit by bit, by some of them turning first into gristle then into bone in the middle, to make levers for the others to work with. *So that every bone in the body* (except part of the head) *is the lime-hardened core of a muscle or group of muscles.* Even the back-bone grew up originally, not as a sheath for the nerve-cable, but as a literal stiffening-rod for the body, in its movements forward by the leverage of the fins. The joints are simply places where the core of a limb or of the stiffening-rod didn't harden into bone.

Now all this time we have been taking for granted the most important thing in the dog's racing-machine, his muscles. We have done so for two reasons, first, that you can so easily see and feel them at work, that you know more about them than of any other part of the body. Second, that by watching them at work in the gallop, the trot, the walk, and seeing something of the machine they have built, we have learned more about them and are better prepared to guess their shape and position than even if we had dissected a dog and studied them directly.

But perhaps some of you may be a little puzzled as to just what muscle is, although you have always heard so much about it. Muscle is simply what in the butcher-shop or kitchen we call "meat" or more exactly lean meat. It is a clear, red body-stuff which covers the bones and makes half the weight of the entire body. By it every movement in the entire body, running, leaping, breathing, swallowing, barking is carried out, and it does all these by simple pulling, never pushing.

It is the only thing in the world that can move of itself. And it does this in a very curious way by simply changing its shape. It has the power of shortening itself, or "contracting" as the wise men call it. So that when one end of it is fastened to the bone above a joint, such as the elbow, and the other below, when it shortens it bends the arm. As it shortens it becomes thicker, as you can readily feel by placing your hand upon the front of your arm and sharply bending your elbow. The more it shortens, the more it swells in the middle, for it does not change its size at all, but only its shape. If you were to measure it exactly, you would find that it had gained in thickness just as much as it had lost in length, so that its bulk stays exactly the same.

It is easy to see how a muscle bends a limb by simply shortening, but how can it stretch or straighten one by pulling only? Look at your elbow again while it is bent. At the back of the joint is a strong spur of bone, the "point," like a handle, or lever, to pull the arm back straight again. And that is precisely what it is, for if you will put your hand on the back of your arm and then strike sharply downward with your fist, you can feel the muscle swell up under your fingers as it pulls the arm down by the elbow-lever.

And upon some form of this simple plan, every movement of the body of the dog is carried out. Each limb has a bundle of muscles, running from the body down the front of it, which swings it forward and lifts the feet from the ground, and another bundle down the back of it, which pulls the leg and foot backward, as in

scratching, or if the foot is held firmly against the ground, throws the body forward, as in running and leaping. So when the dog gallops, starting with his hind feet well forward under him, the powerful muscles on the back of his hind-legs, acting with the great bundles which make up the breadth and strength of his back or *loins,* straighten out his "C-spring" and launch his body forward; at the same time, those on the front of his fore-legs lift and pull them forward into position to catch the body and prop it, until the corresponding group on the hind-legs can swing them under and to the front once more, and the "wheel" swings round again.

Every "corner" of bone, that you can feel under the dog's skin or your own, is a lever or handle for the attachment of muscles. You will find a spur on the dog's elbow (which you remember is close up to his body) almost like your own. His "hind-knee" or hock has another lever on it, which corresponds to the "spur" of your heel and gives a hold, by which the great muscles of the calf or ham, can raise the body from the ground. These are tied to the end of the lever by a strong sinew, the "ham-string," which you can easily both feel and see in the back of your own heel. If you will place your hand on the calf of your leg, and then rise on tiptoe, you can feel the muscles swell and harden as they lift the heel, with the weight of the body upon it, from the ground. The angle of the jaw, just below and in front of the ear, is another lever, and placing your fingers on your cheek above it a short, thick muscle bulges up whenever you clench your teeth firmly together. This however is a lever of a different class from the others, the power being applied between the joint-fulcrum and the weight, instead of the weight at one end and the power at the other as in the elbow. Every joint in the dog's limbs, as well as in your own, is moved by some sort of lever, and if you will puzzle out one or two of them for yourselves by handling them, and feeling the muscles swell as they move them, you will gain a better idea of how every sort of living animal moves, than you could by hours of reading.

A PLEA FOR THE ARCHITECTS.

BY F. W. FITZPATRICK.

OUR school children are thoroughly familiar with the names of the heroes and near-heroes of our Revolutionary and Civil and Spanish wars; youths and maidens, in college and university, can prattle interestingly about the heroes of Greek and Roman history; men further advanced in erudite paths can charm us with the depth of their knowledge, even anent the intellectual Brahman, the chivalrous Rajput, the wild Bhil, or the naked Gond. The average man is surprisingly well read upon most subjects. He still remembers the heroes he was brought up on, even to the Spartan and the Gaul; is familiar with the names, too, of the great discoverers and historians; does not balk at those of famed musicians, astronomers, and *some* artists, and has the names of the celebrated authors of fiction right at the tip of his tongue.

But most wonderfully ignorant is he—our average man— of the names of those men who have contributed most to his and to his ancestors' comfort, education, and refinement,—yes, to his civilization,—the architects. Even among our erudite friends above mentioned, few—amazingly few in proportion to those versed in any other one art or science--dabble in architecture or know or care much about the men who are "charged with presiding over the structures that shelter man, his animals and the products of the soil; who build up those immense cities, their splendid monuments to our progress, those thousands of manufacturing-plants, housing the prodigious industries of our times,—men who have written and are writing history in ineffaceable characters of steel and stone."

Is it not surprising that so little is known of those men, and that so little importance is attached to their works in a science to which we owe such marvelous creations; that is so useful, of absolute necessity to *all* our undertakings, and that absorbs so many millions in money and keeps such armies of men employed? Is it

that familiarity with the results breeds an indifference to the causes? Then, too, is it not strange that the lesser arts outrank in popular esteem the mother art from which they sprang, and that whenever an architect also excelled in any other art he is invariably known and remembered for his works in that line rather than for the greater works he executed as an architect? Michel Angelo Buonarroti is far oftener mentioned as a sculptor or painter than as an architect, though his works in the latter capacity far outshone any of his efforts in the former. So with Bramante and Brunelleschi, and so with Ligorio, who, though a master in our art, is known to posterity merely as an antiquarian. Geber, the designer of the Giralda tower, little dreamed that he would be forgotten as an architect and remembered only as the inventor of a process that facilitated his calculations—for it was he who invented Algebra. So also is Leonardo da Vinci almost as often remembered, and perhaps far more gratefully, as the inventor of the lock-canal system, even now in use, than as a great architect, though mention is made of him sometimes as a painter.

It might be a most fascinating digression but we are not now concerned, in this rambling plaint, with any speculations as to the authors of those ancient structures in the primeval cities of Phœnicia, China, Chaldea, and Egypt, where Architecture, as an art, may be said to have had its birth; nor may we trace down, even briefly, the early history of that art, nor how, through the testimony it offers us, we can trace our ascent back through Britain, France, Italy and Greece to the Druids, and our relationship, through the latter, to the ancient peoples of Syria, Persia, Arabia, and that Sanskrit-speaking race that entered India across the upper Indus and settled in the Punjab, during the Kali Yug epoch, at least five thousand years ago! In these few pages we can give merely a passing glance at the names of a few from among the hundreds of architects of past and present times whose works well merit the placing of their names upon the "tablets of the Immortals," among those of the heroes to whom we and future generations should burn incense.

We read much of Pericles, and how, under his wise management of public affairs, the Parthenon—Greece's most perfect example of architecture—was erected in 428 B. C. Ictinus of Athens was its architect, assisted by Callicrates. Phidias did the statuary and decorations only (although he is generally credited with the entire design) and won immortal fame. That pile is, even to-day, a model for us, a standard of perfect proportions. How many

readers who know *all* about Phidias, Pericles, and the Parthenon, ever heard of Ictinus? The temple of Apollo Epicurius, on Mount Cotylus in Arcadia, is another beautiful example of that master's skill. Archias of Corinth, who flourished in the fifth century B. C., is also a name to conjure with, as is that of Cleomenes of Athens, who planned the city of Alexandria in Egypt, and Isotratus who added much to that city. We ought fondly to remember the name of Calimachus, if for nothing else, at least on account of the pretty fable connecting his name with the origin of the Corinthian capital. Then should we also inscribe upon our tablets the names of Hermodorus of Salmis, who designed the temple of Jupiter Stator, in the Forum at Rome, and of Cyrus, who, just before the Christian era, was Cicero's friend and architect. Who has greater right to fame than Vitruvius Pollio, of Fano, one of the greatest writers on our art, an authority still in use, the Blackstone of architecture? Then, in the same century—the first after Christ—Vespasian and his son Titus astonished Rome with the Coliseum, that vast amphitheater (seating over 80,000 people and built in less than three years) that we know so well and have seen pictured so often even if we have not seen its ruins. I venture to assert that not one out of a hundred thousand people—no, nor one out of a million—ever heard the architect's name. The matter is apparently so very insignificant that some historians merely surmise that Rabirius was the man, while others vaguely hint at the name of Mustius.

Volumes have been devoted to abusing the fawning friends and advisers of the sensuous, albeit great, Nero. Their names and those of his freedmen and principal slaves are well known; but—perhaps luckily for the profession—we never read the names of Celer nor of Severus, his architects and chums—men who, when he and his court grew sluggish in devising new deviltries, were called on and always produced some rare and exciting diversion. They "induced him to build" (how familiar that expression sounds!) his famous "golden house," and led him into other wild extravagances that contributed much to his final downfall, but gave to Rome some of its stateliest monuments.

Of far different timber was the sage Antonius, better known as senator of ancient Rome than as *merely* an architect, although he was prouder of his design for the Baths of Æsculapius, and they were remembered longer far than any of his brilliant achievements in the political field.

Metrodorus of Persia, who built much in India and in Con-

stantinople, deserves mention and remembrance as being the first Christian architect.

One of the first acts of Justinian upon ascending the throne of the East, in 527 A. D., was to invite Anthemius, the architect, to Constantinople. He was a Lydian, a man of genius. He designed the Church of St. Sophia for his emperor. While the temple of Minerva and the Pantheon were domed structures and antedated this church, yet it is the first example of an aerial cupola ever built, a noble pile, still standing and the wonder of every visitor. St. Mark's at Venice, built by Ausciles the Greek in the ninth century, and hundreds of other buildings down to our own days, had their cupolas patterned after this ancient model.

Architects have ever been known as men of exemplary lives,—there being rare exceptions, of course,—but few, however they may have merited it, have ever been "sainted"! The Catholic Church has conferred the honor of canonization upon but three of the profession, and that for no architectural reasons; all three,—St. Germain, St. Avitus, and St. Agricola,—who lived in the sixth century, being bishops of great sees in France. There have been other bishops,—fifty or more,—and archbishops, abbots, priests, and monks galore in our ranks, or, rather, men of both ecclesiastical and architectural attainments. It is not surprising, however, for, from the eighth century all through the Middle or "Dark" Ages, all learning, letters, and arts were confined to the clergy of Europe; the laity being "confined" mostly in each other's castle-dungeons or to cutting each other's throats. York Cathedral was completed by three succeeding bishops, Egbert, Albert and Eaubald. Old St. Paul's was designed in 1033 by Mauritius, Bishop of London; and Rochester Castle and the old White Tower of London were designed by Bishop Gundulf of Rochester.

The thirteenth century saw, if not the birth, at least the springing into prominence of the semi-religious orders of Masonry, that exercised a most wonderful influence over the art of building; even the name "architect" being lost for a time. "Master-mason," "Supervisor," or "Surveyor" were the titles of those under whom great public works were erected, so that in the more powerful states of Europe the Church practically controlled both building and architects for a period of nearly five hundred years!

Why should Romualdus of France be forgotten,—he, who in the ninth century built the great cathedral of Rheims, the first example of Gothic architecture? Or Buschetto, who in 1016 gave us

the Duomo of Pisa, the first example of the ecclesiastical style of art that made the Lombards famous in their time?

Dioti Salvi, who designed the Baptistery of Pisa, and the German Wilhelm, who built the leaning tower of that city, both merit some recognition, and surely so do Pietro Perez and Erwin von Steinbach, who gave us, respectively, the grand old cathedrals of Toledo and of Strassburg. Brunelleschi, born in 1377, acquired fame as a sculptor and as an engineer, but the noble monument he left to his skill as an architect—the dome of Santa Maria del Fiore—should alone suffice to cause his name to be inscribed among the elect.

Bramante Lazzari, who first designed St. Peter's at Rome; Rafaelle d'Urbino, the St. Gallos, and Peruzzi, who later carried on the work, surely merit some recognition, although Michel Angelo de Buonarroti changed much and nearly completed that great building. Then, too, Jacapo della Porta, Domenico Fontana, Ligorio, and Carlo Maderno contributed to the completion of St. Peter's, finishing it just one hundred years after Bramante's first design was made. Credit is due them, if for nothing else, for carrying out Michel Angelo's designs with so few changes.

What versatility, what splendid talents, were possessed by those old masters of the Roman school founded by Bramante, and how many there were of them in that sixteenth century, so abounding in great men and great events in the world's history! Michel Angelo —the "grand old man of Rome," the dignified and haughty, before whom even the Grand Duke Cosmo, the tyrant of Florence, stood uncovered, whom popes and rulers courted—stood prominently alone as an architect. Had he not won fame so, his "Moses" was sufficient to insure him honor as one of the greatest sculptors. Had fame still been lacking, his paintings in the Sistine Chapel would make him rank with Titian as a painter. Still, more, he was a poet whose works, had they not been overshadowed by his towering mastery of other arts, would have placed his name among the greatest of his time. Raphael, the dreamer, the beloved, the idol of Italy, enriched that country with his marvelous works, and Leonardo da Vinci was the miracle of that age of miracles. Think of the endowments of that one man. An architect, chemist, engineer, musician, painter, poet, philosopher, inventor, and discoverer, and *excelling* in each and every attainment! His writings show him to have anticipated by the force of his own intellect some of the greatest discoveries made since his time by Galileo, Kepler, and Castelli, the system of Copernicus, and the theories of recent geologists. Barozzi

da Vignola, the designer of the Farnese Palace at Caprarola, was one of the last of that school, and that palace is to-day used more than any other by our students and disciples as a standard of Italian architecture.

Who has not read of the Tuileries, the Luxembourg, and the Louvre in Paris, and how few ever know or care that Philibert de Lorme, Jacques de Brosse, and Claude Perrault were their designers?

With us of the English race Inigo Jones and Sir Christopher Wren ought to be household names. The first designed Whitehall, Lincoln's Inn, and Covent Garden; the latter—besides being the architect of St. Paul's Cathedral and erecting the largest palace and most stupendous hospital in all England—found time to plan the rebuilding of the city of London after the great fire in 1666, and to design pretty nearly every church in the new city! Old England has contributed many other men "whose works live on among us 'though their names be forgotten." Sir William Chambers, the Pugins, Joseph Gwilt, Fergusson, George Edmund Street, and Sir Gilbert Scott, merit a better fate than the oblivion into which every architect knows he will ultimately be thrust.

One reads of a great battle in ancient or modern history, and the names of the generals who led the contending forces will immediately present themselves to the memory; a quotation from a well-known poem instinctively recalls the author; the recollection of a great speech brings to mind the orator; and the name of the artist is always associated with or appended to a painting. Yet, however great, however beautiful, a building may be, and however much we may admire or appreciate it, how few of us ever care a rap who *its* author is? We all know and admire the Grand Opera at Paris and have seen it, pictured at least, time and again; but who ever associates it with or thinks of Charles Garnier?

Our own country, young as it is, is replete with noble monuments that we visit and cherish and are proud of, but whose authors are to us unknown,—mere insignificant incidents. Even the little children in our schools, living thousands of miles from Washington, know the Capitol building. It is held up to them as one of the greatest buildings of the world. Its history is familiar to them; how it was burned by the British, its great dome and its wings added in later years, and so forth; but I never heard of even a hint being given to a child by parent, teacher, or text-book that Hallet first designed it, or that Hadfield, Hoban, Latrobe, Bulfinch, Walter, and Clark added to it and completed it; or that the Treasury Build-

ing—our Parthenon—the most chaste and beautiful design ever executed in the country, is the work of Robert Mills, Walter, Young and Rogers; that Thomas Jefferson designed Virginia's Capitol at Richmond; or that R. M. Upjohn designed Connecticut's handsome Capitol at Hartford.

The fame of Trinity Church at Boston is spread far and near, and who has not seen in his own town a replica—a copy in a minor chord—of the magnificent court-house at Pittsburg? Another ten years, and how many Bostonians even will remember that H. H. Richardson designed both?

There are men among us who have performed feats of daring, as our American steel and brick structures, the like of which have never even been attempted in other lands, may well be called. We admire those huge many-storied buildings of New York and Chicago; they impress us by their size, beauty, and (in spite of their height) their grace; but it would be altogether uncalled for and out of place for any one to inquire who designed them. And but a while ago we surprised the world with an aggregation of buildings of greater magnitude, of nobler design, and of greater impressiveness than had ever been grouped together on the globe. The World's Fair buildings at Chicago mark an epoch in the history of architecture, a great revival of classic art; yet, unlike other buildings, we have not even their ruins to contemplate. They can be to us but a beautiful dream. Surely we cannot afford to relegate to absolute oblivion the names of the men who by that work contributed so much to our own education and pleasure, and made us, as a people, better known and respected by other peoples of the earth than we had ever been or could ever expect to be by any other agencies. I would not inscribe those names upon mere tablets of marble or of bronze, nor would I erect a monument to their memory; but I *would* make them known and loved by a far surer way; I would inscribe them in our school text-books, that our children and their children's children might grow accustomed to the now unwonted sight of the names of our great architects enrolled among those of our leaders, our warriors, our jurists and our poets.

MISCELLANEOUS.

PAUL AND THE RESURRECTION-BODY.

BY A. KAMPMEIER.

It is true, as the Editor says in "The Skeleton as a Representation of Death and the Dead" (*Open Court,* October), that the so-called Apostolic Creed teaches the resurrection of the "flesh," and the orthodox Church continued this doctrine up to our times. But this was not the doctrine of earliest Christianity, and the resurrection of the "flesh" is a later development which had its reasons. It is true also that Paul teaches that some members of his congregations will remain alive till the end and will be carried away into the skies to meet the Lord at his second coming, which Paul himself believed he would live to see, but Paul nevertheless does not teach the resurrection of the "flesh." He clearly says (1 Cor. xv. 50): "Flesh and blood can not inherit the kingdom of God neither doth corruption inherit incorruption." Any one can see from the discussion on the resurrection-body beginning with verse 35 of that noted chapter, as also from 2 Cor. v. 2, 4, that Paul believes that the bodies of those who have died will decay and be transformed as also that the bodies of the survivors will be metamorphosed. He clearly distinguishes between a "natural body" (*soma psychikon*) and a "spiritual body" (*soma pneumatikon*) and claims that the earthly body will be replaced by a heavenly body. Through mystical connection with "the second or heavenly Adam," according to the Rabbinical doctrine of the Messiah, Paul assumes that the believer, a descendant of the first earthly, mortal Adam, will receive a spiritual heavenly body. He says (verse 45 of that discussion): "The first man Adam was made a living soul-nature [but mortal] the last Adam a life-giving spirit-being;" verse 49: "As we bore the image of the earthly, we shall bear the image of the heavenly," and closes his discussion with the words (v. 53): "This corruptible must put on incorruption, and the mortal immortality." But when the corruptible has put on the incorruptible and the mortal the immortal, then the word will be fulfilled: "Death is swallowed up in victory," according to the Rabbinical doctrine, "in the days of the Messiah, God (blessed be He!) will swallow up death."

It may be that Paul conceived that the mortal body stood in some relation to the resurrection-body, but if he says (v. 36), that the seed which is sown is not quickened unless it die, and that the body sown is not the one that shall be, the idea that the body decays and does not take part in the resurrection is perhaps not quite so modern in Christianity as we may think.

In regard to the resurrection of the "flesh" in the so-called Apostolic Creed I cite the following from A. Harnack, *The Apostolic Creed*: "By the

wording 'resurrection of the flesh' the post-Apostolic Church has gone beyond the line, which was given in the common oldest preaching regarding the resurrection and eternal life. There is no doubt that from the earliest times some Christians have preached the resurrection of the flesh, but it was not a doctrine generally held. And many witnesses of the earlier times speak instead of resurrection of the flesh of 'resurrection' simply or 'eternal life.' On the other hand the Church, when about to enter into the struggle with Gnosticism, insisted upon the resurrection of the flesh in order not to lose resurrection entirely. But even this necessity forced upon the Church at that time does not establish the right of the formula. It only helps us to understand the reasons for the formula, 'resurrection of the flesh.'"

The crude idea regarding the resurrection in the German hymn mentioned by the Editor and still unfortunately maintained in hymn-books through the influence of the orthodox party in the German Church, is of course founded on nothing else but the entirely erroneous translation of Job xix. 26, as found in the unrevised German version.

In closing I might also say that it is very debatable whether Paul conceived the resurrection of Jesus in the same way as the Gospels later represented it, since in 1 Cor. xv he places the appearances of Jesus to his disciples on exactly the same level as the apparition he had of Jesus several years later, which was clearly nothing but a vision.

A GERMAN CHRISTMAS SONG.

Christmas is approaching again, and will be celebrated in innumerable American homes in the old German fashion with a Christmas tree adorned with nuts and apples and candles. It reminds us of the song to the fir-tree which is sung by German children on entering the room where they receive their Christmas gifts. It is strange that (at least so far as we know) it has never been rendered into English. It is true that Longfellow translated a similar folk-song in which the fir-tree is used as a symbol of faithfulness and is contrasted to the fickleness of a maiden, but the character of the songs is different, although some lines, including the entire first stanza, read exactly the same. Longfellow translates *Tannenbaum* by "hemlock-tree," which is somewhat misleading, as hemlock primarily and generally means the poisonous herb of that name except locally in North America.

We offer here a versified translation in the original meter so as to fit the melody of the German song which (with only a slight change) is the same as the tune "Maryland, My Maryland!" Our version reads thus:

O fir-tree good, O fir-tree dear,
How do thy leaves endure!
In summer thou hast verdant been,
In winter still art dressed in green;
O fir-tree good, O fir-tree dear,
No tree is better, truer.

O fir-tree green, so tall and straight,
A sermon thou wilt preach us:
That constancy and faithfulness
Give strength and courage in distress,
O fir-tree green, so tall and straight,
This lesson thou dost teach us.

O fir-tree dear, lit up full bright
As Christmas-tree we raise thee.
How often have thy candles clear
Spread mirth and joy and Christmas cheer,
Thou symbol of life's hope and light,
How do we prize and praise thee.

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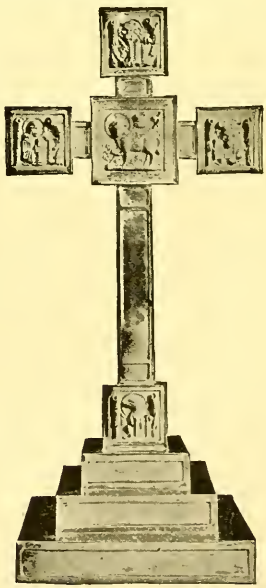

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