OBSERVATIONS ON THE EARLIER CLAIMS TO THE DISCOVERY OF THE CIRCULATION OF THE BLOOD.

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When great discoveries come into the hands of men of science and progress, they are used as the means of looking forward to some more distant truths, as a kind of vantage-ground from which unknown wonders may be discovered. "The light which we have gained" (writes Milton) "was given us not to be ever staring upon, but by it to discover onward things more remote from our knowledge." But it is altogether otherwise with antiquaries. The lights which we gain are used by us (consistently with our professed object) to look back upon the past, and see whether scintillations of it may not be traced into the dim vista of ages; whether "coming events," in the words of the poet, did not "cast their shadows before," and every great discovery have a prophetic anticipation in some obscure and sybilline form. This has been eminently verified in the great discovery of the circulation of the blood by our illustrious Harvey. Notwithstanding the clamour and vehemence of the opposition raised against the new theory, especially in Italy, the scene of his early studies (where the preliminary discovery of the valves of the veins, by his master Fabricius ab Aquapendente, had directed his observations to the use and functions of the heart in connection with this important fact), numberless claims were advanced to the anticipation of the truth of the circulation of the blood, beginning with Plato and the Scholiasts on Euripides and Plutarch, and ending with the learned but unfortunate Servetus in the 16th century. The great vagueness, however, of these earliest statements, renders it extremely doubtful whether they do more than approach the idea of the circulation of the blood; while the profound ignorance which then prevailed in regard to the relations between the principal organs of the human body, and the manner in which they contribute to the formation and passage of the blood throughout the system, would lead to the conclusion that they are rather poetical than practical anticipations of the coming truth.

The famous passage of Plato runs thus: "The heart is the centre of the bloodvessels, the spring of the blood, whence it flows rapidly

round. Blood is the *pabulum* of the flesh in order to the nutriment of which the body is intersected with canals, like those of gardens, to convey the blood like water from a fountain to the remote parts." This, doubtless, furnished the text to those early Eastern fathers who anticipated the work of Paley and others in a later day, and endeavoured to demonstrate the being and attributes of the Deity from the wonderful structure of man, His greatest work. Thus Theodoret, in his sermons on "Providence," amplifies the words of Plato, and St. Gregory of Nyssa, the brother of St. Basil the Great, in his remarkable treatise, "*De Hominis Opificio*," so illustrates it, and even advances beyond it, as to lead us to give him a kind of "*proxime accessit*" to the grand truth which it was left for a later age really to disclose and to establish. As far as I am able to understand the thirtieth chapter of this very interesting and early work on "Natural Theology," the writer having stated that the heart is the fountain and principle of vital heat, and even of life itself, makes the liver the originating source of the blood, suggesting such a circulation between these two great organs, by means of veins and arteries, as in some degree to foreshadow the then distant truth. The colour of the blood he derives from the heat generated by the heart, and conveyed to it in its passage from the liver, from which it comes merely in the form of a colourless stream; comparing this action to the mountain snows which swell the stream, and fill even its earliest veins and sources. The singular feature of all these earlier descriptions and illustrations is, that the action of the lungs and their part in this great economy were wholly unrecognized, and even unknown, the great *trias* of the heart, the brain, and the liver being regarded as the pillars of our human life. A much nearer approach appears to me to have been made by Aquinas, about the year 1250, to the doctrine of the circulation of the blood, in his short treatise, "*De Motu Cordis*," which was published among his Opuscula, at Douai.

"The motion of the heart," he writes, "is the principle of all motion in animated life . . . and in order that the heart might be the beginning and end of all the motions which are in the living being, it had a certain motion, not circular, but *like* a circular motion, composed of a double pulsation *(tractu et pulsu)** . . . This motion is also continuous while animal life lasts, except the interposition of a short pause between the two pulsations, the only point in which it fails of a circular motion. . . . And these two motions, which seem to be contrary, are, as it were, the parts of a motion composed of both, and though

* *i. e.* Dilatation and contraction, in technical language, the "diastole" and "systole."

failing to present the simplicity of a circular motion, it imitates it in so far as it is *from* the same *into* the same, and thus it is not inconvenient (or unsuitable) that it should tend towards divers parts, since a circular motion sometimes has that character." (*Opusc. Duaci*, 1609, page 968-9.) It would appear that Aquinas, ignorant of the structure of the body internally, and only able to gather a little knowledge from a comparison of the human frame with that of animals generally, was led to derive from the phenomena of inspiration and expiration in connection with the pulsation of the heart and its two distinct motions, the idea of a circulating motion within, and thus seems to have made a slight approach, however distant and conjectural, to the great theory of Harvey. It has often been alleged that a still higher vantage-ground was gained by that profound physician and unhappy victim of religious persecution, Michael Servetus, and that his remarkable and rare work, called the *Restitutio Christianismi*, contains the germ of the theory of Harvey. I have sought in vain for any proof that this is really the case, the only point in which the question is at all approached, being that in which the human nature of our Lord is defined and illustrated—a passage occurring almost in the middle of the treatise. He asserts, indeed, that in the birth of human being "the valves of the heart, or the membranes at the orifices of the vessels of the heart, are opened," and that then, by the wonderful "skill" of the Creator, "a divine soul is breathed into man, the opening of the heart takes place, and the immission into it of the vital blood." And, in his comparison of the human body to a plant, he seems to have an idea of a circulation of the vital fluid through veins and arteries. But in his adherence to the notion that the liver is the centre and fountain of life, he appears to be behind Aquinas and the earlier writers, and to have simply followed Hippocrates and Galen, whose theories were so entirely dissipated by the great discovery of Harvey. I fail, indeed, to see that he had advanced beyond St. Gregory of Nyssa, who wrote in 380.* If I understand his words aright, even the great Dr. Bentley, in his Boyle Lecture, called "A Confutation of Atheism, from the Structure and Origin of Human Bodies," delivered in 1694, did not admit the great discovery of his century. For he illustrates the Divine wisdom by the fact of "the artificial position of many myriads of valves, all so

* Zanchius, the Italian reformer (1516-1590), in his work *de Hominis creatione* (l. ii., c. i.), made a much nearer approach to the true theory. He begins a long and interesting passage describing the functions of the heart, by affirming that it is firmly bound to the rest of the body by veins, arteries, and nerves, "partim ut vita *ab ipso* in reliqua membra communicando *diffundatur;* partim ut *in ipsum* alcoium vicissim officia et beneficia *referri* queant."

situate as to give a free passage to the blood, and other humours, in their due channels and courses, *but not to permit them to regurgitate and disturb the great circulation and economy of life*" (page 15). In which words he seems to halt between two opinions, and to deny that very circulation of which he speaks. Probably, he feared equally the Scylla of the old doctrine and the Charybdis of the new. In any case, we may well arrive at the conclusion that the great Harvey—the child of Folkestone by birth—the adopted child of the whole world, which he made the heir of his grand discovery, stands forth as the true and only *Claimant*—and that we might as well hunt through Australia for the real Tichborne, as explore the dark places of antiquity to find the real predecessor of Harvey. But we should do great injustice to the grandeur of his character if we were to rest here on the mere threshold (as it were) of his discovery. The highest attribute of Harvey's nature was the retirement, the reticence, the almost secrecy with which he nourished his great idea. From 1616, the year in which he introduced it into his lectures, until 1628, in which he presented the great truth, he had discovered, to the scientific world—how many anxious misgivings, how many conflicts, and fightings, and fears he must have encountered! As it is said of our Lord Himself, that He hid Himself from the multitude, and yet could not be hid, inasmuch as His very work betrayed His presence; so it might be said of every one of those to whom the truth of God has been revealed—their very silence is eloquent—"*tacendo maxime docuit.*" It was noted of Harvey, from the first, that he never treated his great discovery controversially. He never entered into the arena of scientific warfare (and medical scientific warfare, like theological, is ever wont to be carried on ruthlessly, "to the bitter end,") but bequeathed his grand discovery to posterity, enshrined in the elegant Latin of his immortal treatise. O! what a strife of tongues did that wonderful publication originate! The great critics of Leipzig, in the *Acta Eruditorum*, of 1686, said well:—"The fortune of sudden and unexpected things (as Seneca as observed) is rarely constant—and this, the warfare of the learned, upon the anatomical discoveries of the present age more than sufficiently proves. For, to the present moment, some are superstitious enough to hold that any one who opposes himself to the ancients is guilty of a hideous crime, and would rather err with Bartholomæus Eustachius, in his blind following of Galen, than dare to think with any new master. It is not, therefore, to be wondered at, that the golden discovery of the circulation of the blood, made in our own age, contrary to all earlier opinions, by William Harvey, has been subject to the same fate—and

is set down by some of the slaves of Galen as a frivolous and silly falsehood." But the old proverb, "*Plus rutilat veritas ventilata*," had here one of its fullest illustrations. Truth has triumphed, and shines forth in all its lustre, and the minister of a truth which has, more than any other, ministered to the life of mankind, has been honoured throughout the world, and is at last about to receive that honour which, though it ought to have been his earliest, cannot in any case be his last—honour from his own countrymen and his own townsmen. This latest honour is now about to be rendered to him, and we may well invite, and even entreat, all who have gathered round us in this place, to help us to make the memorial of this great man a worthy tribute, as far as it can be, to one who has long passed away from the earthly conflict, and never had in view any earthly crown—who might have exclaimed (like the prophet) to an ungrateful world, "I have laboured in vain, I have spent my strength for nought and in vain, yet surely my judgment is with the Lord, and my work with my God." (Isa. xlix. 4.)