chemistry of the glands, are well and clearly written. The clinical picture of goitre and the general account of myxoedema and Basedow's disease contain all that is necessary, whilst there are two excellent chapters, one upon the thyroid in infectious diseases, and one upon thyroid feeding in general therapeutics. The chapter dealing with myxoedematous infantilism is disproportionately lengthy; and in view of the author's extreme indebtedness to Dr. Hastings Gifford, whose papers on the subject were published in the BRITISH MEDICAL JOURNAL in 1904, it is a blemish to misspell the name; Hutchison, too, is spelt Hutchinson throughout. The defect of the book, however, is in the histological descriptions. On page 139 the statement occurs that "the lesion (syphilis) is differentiated from tubercle by the absence of giant cells and degeneration;" surely a highly fallacious criterion. It would be difficult, indeed, to recognize the varieties of enlargement of the thyroid, and discriminate specimens by the light of Dr. Richardson's verbal account, and the illustrative figures of sections are quite inadequate. The part of the book dealing with cancer of the thyroid is meagre in the extreme. The value of the radiographs of epiphyses in infantilism of the "type Loraine" is considerably diminished by a comparison with Poland's *Atlas*, which demonstrated the great variation normally existing between the first and last child of healthy parents as regards ossification and junction. The surgery of the thyroid gland is fairly well sketched, but the extreme urgency of operation when once an attack of nocturnal dyspnoea has occurred in a goitrous patient is not sufficiently insisted upon.

MEDICINE AND WITCHCRAFT IN THE DAYS OF SIR THOMAS BROWNE.

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"It is a riddle to me, how this story of oracles hath not wormed out of the world that doubtful conceit of spirits and witches; how so many learned heads should so far forget their metaphysics, and destroy the ladder and scale of creatures, as to question the existence of spirits; for my part, I have ever believed, and do now know, that there are witches. They that doubt of these do not only deny them, but spirits: and are obliquely, and upon consequence, a sort, not of infidels, but atheists. Those that, to confute their incredulity, desire to see apparitions, shall, questionless, never behold any, nor have the power to be so much as witches. The devil hath made them already in a heresy as capital as witchcraft; and to appear to them were but to convert them." . . . "Again, I believe that all that use sorceries, incantations, and spells, are not witches, or, as we term them, magicians. I conceive there is a traditional magick, not learned immediately from the devil, but at second hand from his scholars, who, having once the secret betrayed, are able and do empirically practise without his advice; they both proceeding upon the principles of nature; where actives, aptly conjoined to disposed passives, will, under any master, produce their effects. Thus, I think, at first, a great part of philosophy was witchcraft; which, being afterwards derived to one another, proved but philosophy, and was indeed no more than the honest effects of nature: what indented by us is philosophy; learned from him, is magick."

Thus wrote the author of *Religio Medici*, in the year of grace 1635, regarding the special item of his creed which was concerned with witches and witchcraft. The writer, who was then aged 30, retained this article of faith through life with unyielding conservatism, for we find him after another period of thirty years giving "expert" evidence at a trial of two women accused of witchcraft, which aided most materially in procuring their conviction and execution. As associated landmarks in the history of human opinion, I will just call the attention of the reader at this preliminary stage to the fact that the date of Sir Thomas Browne's birth (1605) corresponds to that of the publication of the first issue of Bacon's *Advancement of Learning*; that his *Religio Medici* was published ten years after the appearance of Galileo's *Dialogo*; and that the now noted witch trial in which he figured was coeval with the Great Plague of London—whose horrors inspired the genius of Defoe, and also led to many strange demonstrations of spiritual belief among numbers of the more emotional of his contemporaries. As this same trial underwent some considerable discussion a few months ago in the pages of the BRITISH MEDICAL JOURNAL, in connexion with the question of

the completion of a monument to the memory of one of the most celebrated of England's physicians, it has occurred to me that a bird's-eye view of some of the more prominent opinions of Browne's generation regarding the supernatural and the unknowable might be of interest to the readers of this JOURNAL in connexion with the celebration of his tercentenary birthday. The voice of an eminent Irish physician has been raised in opposition, with the gruesome protest that "His record is stained with innocent blood," and the very necessary corollary that he, on this account, remains unworthy of having a national or municipal, and still more so of having a medical, monument erected to the honour of his memory.

In connexion with this criticism, I hope to lay before my readers sufficient material for the formation of an unbiased opinion regarding the claims of the author of the *Religio Medici* on the homage of professional posterity, and for a fair estimate of the value of the "blood accusation" with which an attempt has been made to neutralize the same.

In order to the formation of anything approaching fairness of judgement regarding the opinions of Thomas Browne on matters supernatural, it will be necessary to divest ourselves, as far as possible, of all latter-day prejudices and preconceived notions, and to fancy ourselves, for the time being, transferred, in deed as well as in thought, to the very different surroundings and conditions in which he and his contemporary compatriots lived their strenuous lives. We must, in imagination, divest England's harbours of their steamships, torpedo-boats, and destroyers; strip the country bare of all its steam-engines of every denomination; its railroads, locomotives, and railway whistles; of its electromagnetic machinery, its telegraphs, telephones, arc-lights, swan-lights (and even gas-lights); of its anaesthetics, antiseptics, microbial pathology, scientific sanitation and drainage; its microscopes, its spectacles, and its artificial dentures; of its universal education, unlimited journalistic reading, its broadcast free libraries, its manhood suffrage, and its stereotyped democratic denial of the "right divine of kings to govern wrong." The author of the *Religio Medici* may be said to have been ushered into the world on the agitated—we may even denominate it earthquake-shaken—borderland which connected, and separated, the old world of thought from the new. In his generation England was the theatre of violent social and religious convulsions—a fact which will be vividly brought home to every reader on being reminded that he was junior to Charles I by five years, and that he was knighted eleven years before his death by Charles II, on the occasion of the latter's visit to Norwich. Born in 1605, he had reached the age of 44 at the time of the execution of Charles I; 53 at the death of Oliver Cromwell; and 55 at the "Happy Restoration" of the monarchy. It thus, very evidently, appears that he lived through one of the most unsettled, and even gruesome, periods of England's history. It was a generation in which strange sounds were heard in the air, strange portents were witnessed in the firmament, and for a large proportion of England's population all hope was directed towards the future world, for none seemed to be vouchsafed for their reliance in the present.

At the opening of the seventeenth century, indeed, many of the fossilized, time-honoured beliefs had been exploded or very badly shaken so far as the inner circle of the leaders of thought was concerned; but it still required generations for the rays of enlightenment to penetrate to the multitude; and even the "learned vulgar," to whose ranks Browne so suggestively alludes, managed to long screen their mental vision from the irritating scintillations of novel and entirely undesired items of philosophic and scientific doctrine. The old blend, produced by the original adaptation of Christian doctrine to the preceding Pagan nature-worship still constituted the true foundation—firm, even if apparently submerged—of the stock-in-faith of the rural districts. England's Caledonian King, James I, died when Browne had arrived at the age of 20. This monarch was all through life an explosively demonstrative believer in the witch-and-witchcraft articles of faith. He even took the trouble of publishing under his own name a treatise on Daemonologie, which expresses the orthodox views of the period on this subject in the most uncompromising—and uncharitable—form. Some dozen years before he ascended the English throne he had taken the most active personal interest in the trial of a Scotch lady of rank, who, in the trying period of her parturition, had summoned to her aid a wise woman who bore the somewhat prophetic name of Agnes Simpson. This latter enjoyed in her locality a high reputation for her powers in shortening

the period of childbirth and diminishing the intensity of its agonies. Such practice constituted an act of rebellion against the primal curse pronounced against Eve as a punishment of her disobedience—according to the interpretation of the then young King of Scotland and his spiritual advisers. His Majesty watched the trial, and his interest promoted the conviction of both wise woman and her lady patient of witchcraft and blasphemy. Both were burned at the stake! Such were royal opinion and religious doctrine in Scotland towards the close of the sixteenth century. They were assiduously impressed upon England by the same monarch and his advisers when the opportunity came. (Let inquiring readers remember that it was under the auspices of James I that the Authorized Version of the Bible was prepared, and ponder well the association.) Another century saw comparatively little change of opinion on these heads among the average members of the population. But, let us now skip over another intervening century and a half of human existence, and we are doomed to hear, in the very middle of the “scientific” and “progressive” nineteenth century, quite as noisy an explosion of clerical opinion—on closely similar grounds—against Sir James Simpson, for his free use in obstetric practice of the newly-discovered anaesthetic, chloroform! The arguments of the prosecutors were as of old; clerical methods do not lend themselves to changes of fashion. Fortunately for suffering humanity in general, and for its great benefactor, Sir James Simpson, in particular, the secular arm had in the latter part of the long interval pared down the clerical claws; otherwise the “blasphemous” practice of Sir James Simpson in the middle of the nineteenth century would have been as warmly rewarded as had been that of Agnes Simpson of the same city some two and a half centuries before.

The germs of witchcraft faith would almost appear to have invaded the organisms of our original parents with the forbidden fruit itself, for distinct traces of it have been found to exist among all primitive nations and races whose habits and beliefs have been studied with sufficient care. I have also no hesitation in stating that the connexion between witchcraft and medicine is probably almost as old as the earliest developments of the former, and accordingly incalculably older than the oldest regular or scientific practice of the latter. The mysteries of disease, the unknown mechanisms of the bodily organs, and their utterly incomprehensible functions—all were entirely outside the jurisdiction of primitive intellectual conception or scientific attainment; and accordingly no rational ways or means could under such conditions possibly be devised for the treatment of the physical ills of the human frame—other than, perhaps, those of the simplest forms of mechanical lesion. Precisely on that account, the victims of suffering—of mysterious internal, or of loathsome external, disease—promptly turned to any, and every, supernatural agency which promised any hope of relief. The Egyptians of old, and their Hebrew guests after their exodus, had recourse to priestly advice and treatment. The medicine-man, as wizard and miracle worker, has had a correspondingly conspicuous position among the native tribes of Africa, the aborigines of remotest Australia, and the Indians of the Western continent. Indeed, Cotton Mather attributed the frequency of witchcraft contamination in New England, at the time of its great epidemic visitation, to the influence of evil spirits sent among the colonists by the Indian “Paw-waws.” In both Old and New Testaments, the healing of the sick is nearly always attributed to supernatural influence. The leaning of Oriental belief in the same direction has been maintained even to the present generation. The miraculous cures effected by Christ were aped by Apollonius of Tyana. It has been suggested that the Emperor Vespasian may have been a pupil of the latter; for, when residing at Alexandria, he appears to have become transitorily endowed with corresponding powers: *multa miracula evenere, quibus celestis favor, et quedam in Imperatorem inclinatior Numinum ostensa est*. The special modes of operation would appear to have been familiar to the populace of the (then) most learned of civic communities: for a blind man threw himself at his feet imploring him to touch his dim orbs with the imperial saliva; while another person lame of one hand (*manu eger*) begged to be honoured by a kick (*ut pede ac vestigio Caesaris calcaretur*). Both had been persuaded by the authority of Serapis that such were the proper procedures for the cure of their respective ailments. The Emperor, evidently cultivating popularity, obligingly consulted his own medical advisers, who made the courtier-like reply: *id fortasse cure*

diis, et divino Ministerio Principis lectum. Acting promptly on the suggestion, Vespasian spat upon one petitioner and kicked the other. Both were, of course, cured on the spot! The popular faith in the curative efficacy of touch was transmitted down through all the ages, and inspired the recourse of the physically afflicted to contact with holy relics, to the touch of the royal hand, and ablation or aspersion with the waters of holy wells and streams. And in the times and localities where such supernatural powers of healing existed, there were also found the antagonistic agents of evil—the latter, as a rule, very highly predominating. Amulets, incantations, charms, and philters were all various outward and visible signs of the inward and spiritual belief in the powers of supernatural agents to effect certain modifications in the human economy which were not attainable by any known physical methods. In Germany the belief extensively prevailed that muskets might be charmed from firing, that an amulet prevented the escape of blood from a wound, and that even a cannon-ball recoiled when it collided with a specially efficacious specimen. During the whole period of the Thirty Years’ War most of the officers wore amulets when on duty.

The more familiar forms of disease and other modifications of the ordinary course of natural phenomena were not, it need hardly be said, so likely to be attributed to witchcraft (or correlated demoniacal influence) as the more rare and startling. Among those likely to arouse suspicion were a sudden attack of acute illness—especially if of comparatively unfamiliar type—prostrating a person in previously good health; convulsive affections, such as epilepsy and its congeners; atrophic affections: infantile atrophy was a special result of a glance of the “evil eye;” diseases accompanied by delirium and spectral illusions. The ligature was a specially characteristic manifestation of witchcraft influence; it meant the sudden suspension of any natural function. Impotence was one of its notable results. It was not, however, confined to the human body, or even to animated nature: a fleet might be fast bound in port notwithstanding the presence of favourable winds and the most strenuous exertions on the part of the mariners; the most prolonged churning of milk might fail to collect its butter, etc. The appearance of very unusual substances in vomited (and other ejected or excreted) matters pretty surely led to suspicion of witchcraft. On this account the melancholic and the hysterical were often believed to be subjects.

That the existence of witchcraft was always recognized by the Church is, of course, well known to every tiro in ecclesiastical history. That it received a new lease of existence at the time of the Reformation—and one recognized in even more emphatic terms—is a fact which is perhaps less familiar. The devil and his angels—all manner of demons and witches included—were probably never more permanently present to the mind of any (even semi) sane individual than to that of Martin Luther. Calvin’s estimate of the facts of such association was correspondingly genuine, if somewhat less explosive. Why it was that those opinions were so widely—almost universally—entertained is the question which probably seems strangely unanswerable to the average reader and thinker of the twentieth century. In order to diminish the difficulty of recalling those now strange conceptions, I will endeavour to throw upon the mental screen of the reader who has adopted my former suggestion of divesting his mind of modern scientific facts and inventions, and the theories and physical comforts and responsibilities therewith associated, some of the views of the general and special phenomena of this mysterious universe of ours which passed for profound, and even (in part) inspired knowledge during the long centuries which preceded the modern developments of science and criticism. Preparatory to this attempt, I will just call his attention to two short quotations from the text of the *Religio Medici*—the first and second of a series of three which were brought under the notice of readers of this JOURNAL for the purpose of proving the author’s ignorance of science and incapacity for reasoning. They are as follows: (1) “Conceive the distinct number of three, not divided or separated by the intellect, but actually comprehended in its unity, and that is a perfect trinity”; and “In brief, conceive light invisible, and that is a spirit.” The selection is a peculiarly happy one for my purpose on the present occasion; the critic was wise in a sense diametrically opposite to what he thought in making it; for there are no better or more appropriate texts in the whole of the famous *Religio* to serve as starting-points in a cursory examination of the special opinions and attainments of the author, and those which prevailed among the learned

oligarchy of his age. Accordingly, I propose to harp on each of these strings at some length. Before proceeding to details, I will just mention with regard to the second quotation that Browne was saturated with the theology of St. Augustine, as every careful reader of his works must have observed. Among the most important of the controversial writings of the greatest and the most logical of the Latin Fathers were those directed against the Manichaean heresy. In that special theological atmosphere, the second person of the Trinity was frequently referred to as the *Lux visibilis*—an epithet devised to indicate the contrast between his illuminating powers and those of the *Lux invisibilis*, or third person of the Divine Triad. A critic who undertakes to reverse the judgement of the learned of all nations and tongues of more than two and a half centuries regarding the merits of the *Religio Medici* should surely have made himself acquainted with such alphabetical items of the theological information before launching some clumsy sarcasm at the diction and reasoning of one of the most deservedly famous of English classics.

When the descendants of the Exiles of Eden became sufficiently numerous to suffer from the competition of their contemporaries in the appropriation of the roots and the acorns, the bananas and the grapes, which had been spontaneously supplied by the beneficent hand of Nature, they were obliged to emerge from their cave and forest homes, and concentrate the greater part of their economic attentions on the practice of the original professions of Cain and Abel. Hunting and fishing formed intermediary and occasional pursuits and amusements; partly dictated by the excitements of the chase and the angle, and partly by the desire for the acquisition of nutritive tit-bits. With the gradual growth of dawning intelligence, a goodly proportion of the time which was not occupied in the provision for animal existence, and in the gratification of the passions, must have been devoted by prehistoric man to contemplation of the phenomena around, above, beneath, and within him. One of the characteristic lucubrations of the author of the *Religio Medici* is "Of the erectness of man." He there refers to the opinion of Galen: "Who in his third, *De Usu Partium*, determines that man is erect because he was made with hands, and was therewith to exercise all Arts which in any other figure he could not have performed, as he excellently declareth in that place where he also proves that man could have been made neither Quadriped, nor Centaur." The Galenic hypothesis was formulated in opposition to the well-known venerable one—perhaps even more flattering to man's innate vanity—which had been made familiar to all readers by the oft-quoted lines of the Latin poet:

Pronaque cum spectent animalia caetera terram
Os homini sublimè dedit, coelumque tueri
Jussit, et erectos ad sidera tollere vultus.

And the continuation of Browne's comment has a further special interest as indicating the blundering origin of opinion which is so prone to occur among superficial commentators who are unable to penetrate the veil of metaphoric expression in which the members of the intellectual oligarchy of every age and nation have been so prone to infold their sublimest thoughts:

The ground and expression of this conceit was a literal apprehension of a figurative expression in Plato, as Galen plainly delivers, the effect of whose words is this: To opinion that man is to look up and behold the heavens, is a conceit only fit for those that never saw the fish Uranoscopus, that is, the Beholder of heaven: which hath its eyes so placed, that it looks up directly to heaven, which man doth not, except he recline, or bend his head backward; and thus to look up to heaven agreeth not onely unto men, but Asses; to omit birds with long necks, which looke not onely upwards, but round about at pleasure; and therefore men of this opinion understood not Plato when he said that man doth *sursum aspicere*, for thereby was not meant to gaze or looke upward with the eye, but to have his thoughts sublime, and not onely to behold, but speculate their nature with the eye of the understanding.

When primitive man commenced to "speculate" the nature of his environments, the intellectual data furnished by his innate ideas must indeed have been limited in quantity and crude in quality. But Plato's observation was sublimely true; he was distinguished from all other created beings by the fact that he concerned himself with things above. And with this hankering for indulgence in intellectual aeronautics developed that restless spirit of inquiry into the mysteries of the unknown which some profess to think remains still as far from its goal as was the point from which it originally started. The contemplation of the continuous—and inherited, if not satisfactorily progressive—effort, and its results, cannot fail to interest every inquiring and enlightened mind. He pre-

bably felt fairly satisfied from an early date regarding the definiteness of the qualities of the sure and firm-set earth on which he trod, and which experience had taught him to utilize in the pursuits of agriculture. Water, although so very transparent and passive, in appearance and physical qualities, was in other respects a good deal more mysterious. Although so very yielding to all manipulation, it was able to overcome fire, the most destructive of all agents; and to destroy life in all kinds of animals not specially made to exist within it. Its presence, too, in appreciable quantity was absolutely necessary to life, both vegetable and animal. And it existed not only on the face of the earth, but in the firmament or heaven above, and beneath the foundations of the earth everywhere. Accordingly, the fact could not be questioned that the earth, which was undeniably flat—with the qualifying irregularities of mountains, valleys, and their adjuncts—was completely surrounded by and rested upon the aqueous fluid, which could always be demonstrated by digging to a sufficient depth. As *homo sapiens* waxed in wisdom—or in curiosity—he found himself far more puzzled by the intangible things than he had ever been by the solid and fluid elements of the earth's surface. Three things were too wonderful for him; there was even a fourth which he knew not, as every inquiring mind has been made to feel in its turn. Overarching the whole field of Nature was the inscrutable and impenetrable "sky," "heaven," or "firmament," which in time became incarnate among presiding powers as Jupiter *Diespiter*. Crossing, day after day, the bosom of this almighty "Father" of Day and Light, the "Son" (sun) passed from east to west, to rest each night after the labours of the day. His presence was productive of, and essential to, light and heat, vegetable growth, and animal comfort. With the increasing intensity of his rays came the "resurrection" of vegetable life, to be succeeded by an annual decay during their recess. He, accordingly, was recognized as the friend and "Saviour" of not only the human race, but of animal and vegetable life all over the world. Then in closer proximity, but mysteriously defiant to the powers of vision, and, in a more restricted sense, to those of the other senses, was the something which must pass into his nostrils in order that the phenomena of life may be maintained. Was this essential factor in the regulating support of vitality identical with the invisible air whose motions produced storms of every variety, or did it merely reside within the subtle element? The definite answer to this question was slow indeed in coming, but some strangely prophetic guesses were made in the long interval. The life-giving "Spirit" was certainly in the air, if not wholly of it; and of these three—over-ruling, saving, and life-giving—powers a *Trinity* was formed by every one of the early religious systems. Accordingly, the parabolic symbolism and metaphoric nomenclature were, in part at least, adopted by the founders of Christianity itself, and have in that way been transmitted down to our own matter-of-fact twentieth century. The nature of the subtle and dangerously powerful "element" of fire necessarily presented special mysteries. But, in a general way, the four elements indicated—earth, water, air, and fire—formed the essential constituents of the known world, probably of the whole universe. They formed concentric shells round the terrestrial globe (*aqua, alv, ignis*—in order) during the prevalence of the Pythagorean system when the rotundity of our planet was recognized. In addition to the four elements enumerated, Pythagoras also postulated the existence of a fifth something, more inexpressibly subtle by far, *ἡ πέμπτη οὐσία*; whose presence penetrated and permeated all, and was essential to every functional activity. This quintessence played a necessary rôle in the development of every physical and vital phenomenon. Various philosophic leaders—as might be expected—criticized and modified the number of primary elements: Hermes Trismegistus considered two—fire and earth—sufficient for all known productions; Thales taught that every form of matter originated from the single element of water.

All students of the history of human opinion—philosophical and theological—know something of the mystical symbolism attributed to numbers in the teaching of Pythagoras; which was, of course, but a Hellenized version of a mixture of Brahminic, Zoroastrian, Chaldean and Egyptian doctrines. Nothing conceivable by human intellect seemed more purely simple and more unquestionably immortal than the nature of number. Nothing more abstract or more immaterial. The Pythagorean philosophy—with its Platonic, Neo-Platonic, Philonic (and very many other less important) modifications and adaptations—percolated the successive strata of all the generations of Western intellect down to that of Thomas

Browne. Its nomenclature has left very visible traces in the literature of Christian theology. The learned and accomplished Synesius—soldier, diplomatist, orator, philosopher, and poet—was consecrated a bishop in the year 410. In his hymns are to be found references to the Deity as the "Unit of Immortal Numbers and of Immaterial Kings," and to the Son of God as the "Unit of Units and Number of Numbers." The latter epithet is one attributed by Hierocles to Pythagoras, in an effusion in praise of the Deity. As ultimate representatives of the abstract and the immaterial, Plato dropped number and substituted idea. He refers to the Divinity as the "Idea of Ideas." The pride of place of the "idea" would appear in turn to have been usurped by the *λογος*, which figures so prominently in the philosophy of "Philo the learned Jew" (who was evidently a favourite author with Browne), and whose presence has always afforded so much turbid inspiration to the commentators on the opening verses of the fourth Gospel. Then came *angels*. Next *aeons*. The conception of a super-subtle spiritual emanation from the eternal and unchangeable underlies every one of these terms.

The number *one*, the unit or monad, was with Pythagoras and his followers a symbol of Divinity, and of a good and pure intellect; while it was figured in the celestial world by the sun, in the intellectual world by the *anima mundi*, and in the human microcosm by the heart. *Two*—duality—on the other hand, represented the principle of Evil, and a corresponding type of human intellect; it was the number of disunion and strife, but it must be added that it also came to be recognized as the number of mutual love and marriage, of memory, of science, and of man himself.

The symbolism of the number *three* presented vastly greater and wider complications. It was early recognized as a specially sacred number: it was the number of perfection; it represented the composition of the primitive trinity to which I have already alluded. All known things may be said to exist in threes: beginning, middle, and end; past, present, and future. Not only is all time thus contained in three, but so, too, is all space: in length, breadth, and thickness—circumscribed within line, surface, and body. God, as the prophet pointed out, orders the world by three: number, weight, and measure. The human microcosm consisted of a trinity: body, soul, and spirit. The soul itself was triple: vegetative, added at the moment of conception; sensitive, at the time of quickening; and intellectual, at the instant of first breathing. Accordingly, we are not surprised to learn, at a later period, of three grades in the angelic hierarchies; of three degrees of beatitude: innocents, martyrs, and confessors; of three theological gifts: faith, hope, and charity; of three intellectual powers: memory, mind, and will; etc. The squaring of three gave the solid *nine*, which numbers the angelic choirs around the throne of the eternal: seraphim, cherubim, thrones, dominations, powers, virtues, principalities, archangels, and angels; the corresponding series of orders of condemned spirits: false spirits, lying spirits, vessels of iniquity, avengers of wickedness, jugglers, powers of the air, furies sowing mischief, sifters or triers, and tempters or ensnurers; the numbers of the senses, four internal: memory, cogitation, imagination, common sense; and five external: sight, hearing, smell, taste and touch. Besides many other less important series of nine, this was also the number of the movable spheres, an item to which I will afterwards return.

More strangely mystical still in its demonstrable associations is the number seven—formed by unity acting as a bond of connexion between two threes. Its influence on the human body was so conspicuous in their eyes that the Pythagoreans denominated it the *vehiculum vitae*. It included both body and soul: the body consisting of four elements and endowed with four qualities, while the soul, as above noted, was of triple nature, and was endowed with the threefold series of qualities—rational, irascible, and concupiscible. It was thus the bond of junction between the soul and the body, and, in virtue of this function, it regulated the generation of mankind—the conception, development, birth, nutriment, and, indeed, whole existence of each individual. If the semen of the male was retained within the uterus for seven hours it surely proceeded to fructification; at the end of the first seven days it had become coagulated and was capable of assuming definite shape; at the end of the seventh month the (still immature) fetus was viable; the capability for survival is determined by the end of the seventh hour after birth; at the end of seven days the relics of the umbilical cord dropped off; after twice seven days the infant begins to turn its eyes towards the

light; after the third seven it turns the eyes and head freely; in seven months after birth it grows teeth; in twice seven months it sits firmly; in thrice seven months it speaks; in four times seven months it walks strongly and begins to run; after seven years new teeth are developed and speech is perfected; at the close of twice seven years comes puberty; at the end of the third seventh year manhood is reached, with full generative powers and characteristic hirsute appendages; by the fourth seventh year increase of stature has finally ceased; by the fifth seventh year the perfection of strength has been attained; during the sixth period of seven years the standard of strength remains the same; at the close of the seventh seventh year the maximum discretion is reached—the perfect age of man; the ninth seventh year closes with the grand climacteric—a period at which death has almost reached his full powers of conquest; the end of the tenth seventh year is the ordinary period of human life, according to the authority of the inspired prophet. Then the limit of human stature was 7 ft., and the human body was composed of seven distinct constituent structures—skin, flesh, arteries, veins, nerves, bone, and marrow. There were seven principal divisions of the human body—head, breast, hands, feet, and generative organs. There were seven black members of the body—tongue, heart, lungs, liver, spleen, and (two) kidneys. In cases of apparent death, life might be regarded as absolutely extinct if there appeared no sign of breathing for seven hours. In cases of absolute starvation, death occurred at the end of seven days. The seventh day was critical in all acute diseases; it was then that a reliable judgement could be framed by the physician. The four cardinal points of the horizon, with the zenith, nadir, and the position of the individual observer, formed a number seven. There were seven planets, whose concentric crystalline spheres rotated around our globe as their centre: in order from without towards the earth these were—Saturn, Jupiter, Mars, Sun, Venus, Mercury, Moon. Their revolutions were respectively guided, each, by one of the seven angels which stood in the Divine presence—Zaphiel, Zadkiel, Camael, Raphael, Haniel, Michael, and Gabriel. Each planet presided over a day of the week, respectively in the same order—Saturday, Thursday, Tuesday, Sunday, Friday, Wednesday, and Monday. Each had confided to its special charge one of the integral members of the human frame, according to the disposition adopted: right foot, head, right hand, heart, organs of generation, left hand, left foot; also one of the seven openings of the head: right ear, left ear, right nostril, right eye, left nostril, mouth, left eye. To each was also sacred one of the birds of the air: lapwing, eagle, vulture, swan, dove, stork, and owl; one of the beasts of the field: mole, hart, wolf, lion, goat, ape, cat; and one of the fishes of the sea: cuttle-fish, dolphin, pike, sea-calf, thymallus, mullet, and sea-cat. The mineral kingdom was also recognized in its more specially estimable representatives. The seven metals were under special planetary protection, in the same order: lead, tin, iron, gold, copper, quicksilver, and silver; so were the seven gems: onyx, sapphire, diamond, carbuncle, emerald, agate, and crystal. The incalculable influence of the number seven was demonstrated by the fact that it governed the movements of the nearest of the planets, and its evolutionary phases—new to first quarter, first quarter to full, full to second quarter, second quarter to evanescence, and return in form of next renewal. By the same ineffable power it regulated the ebb and flow of the ocean tides; and, more mysterious still, its regulating power extended to, and superintended the, periodic phenomena of that most incomprehensible of terrestrial entities—the human female. The strange coincidence of periodicity of ocean, moon, and woman was emphasized—in the judgement of those who believed in the mystical influence of numbers—by the fact that the sum of the added digits, up to seven, happens to be twenty-eight ($1 + 2 + 3 + 4 + 5 + 6 + 7 = 28$). In presence of so many associations and influences, it is not a matter of surprise that the seventh day should be regarded as a natural period of rest and recrudescence—even before the general revelation of the Divine will on the subject. The influence of this number (and its associations) with the chosen people is amply testified by the vast number of its repetitions in the Old Testament and the special functions with which it is connected.

Perhaps even more mysteriously significant in the range and complexity of its cosmic influences was the number twelve. It included the number of the constellations of the Zodiac, those specially-grouped battalions of the "heavenly host," at the head of which the Sun—the source and preserver

of light and life on the earth—appeared to preside during the corresponding monthly sections of his annual course. The "Signs" were usually reckoned from the vernal equinox: Aries, Taurus, Gemini, Cancer, Leo, Virgo, Libra, Scorpio, Sagittarius, Capricornus, Aquarius, and Pisces. Each was, of course, ruled by a presiding angel: Malchidial, Asmodel, Ambriel, Muriel, Verchiel, Hamaliel, Zuviel, Barbiel, Adnachiel, Haniel, Gabriel, and Barchiel respectively. They corresponded naturally to the twelve months of the year, in order: March, April, May, June, July, August, September, October, November, December, January, and February. Each was the special guardian of one of the tribes of Israel: Dan, Reuben, Judah, Manasseh, Asher, Simeon, Issachar, Benjamin, Naphtali, Gad, Zebulun, and Ephraim. Each was associated with one of the twelve orders of blessed spirits: Seraphim, Cherubim, Thrones, Dominations, Powers, Virtues, Principalities, Archangels, Angels, Innocents, Martyrs, and Confessors respectively; with one of the twelve minor prophets: Malachi, Haggai, Zachariah, Amos, Hosea, Micah, Jonah, Obadiah, Zephaniah, Nahum, Habakkuk, and Joel; with one of the twelve Apostles: Matthias, Thaddaeus, Simon, John, Peter, Andrew, Bartholomew, Philip, James the Elder, Thomas, Matthew, and James the Younger. The superintending care of the signs of the Zodiac extended, as might be anticipated, to the sections of the human organism: head, neck, arms, breast, heart, belly, genital organs, hams, knees, legs, and feet, in the same respective order. Each had also its special plant to which it functioned as patronizing guardian: Sang, upright vervain, bending vervain, comfrey, ladies' seal, calamint, scorpion grass, mugwort, pimpernel, dock, dragon wort, and aristolochia respectively; and its own consecrated gem: sardonyx, cornelian, topaz, chalcedony, jasper, emerald, beryl, amethyst, hyacinth, chrysoprase, crystal, and sapphire, in corresponding order. Classic Greece and Rome did not neglect to appoint an aristocracy of *Dii majores*, which were distributed in order to the governing supervision of the Zodiac, one to each sign. The arrangement is referred to by Manilius in these verses:

Lanigerum Pallas, Taurum Cytherea tuetur
Formosus Phoebus Geminos; Cyllenie Cancrum,
Jupiter et cum matre Deum regis ipse Leonem;
Spicifera est Virgo Cereris, fabricataque Libra
Vulcano; pugnax Mavortii Scorpium haeret.
Venantem Diana virum, sed partis equinae;
Atquo angusta fovet Capricorni sidera Vesta;
E Jovis adversum Junonis Aquarius astrum est;
Agnoscatque suos Neptunus in aequore Pisces.

Even the genesis of a special wind was attributed to each of the twelve signs of the Zodiac: of Africus to Aries; Circius to Taurus; Aquilo to Gemini; Septentrio to Cancer; Thrascias to Leo; Argestes to Virgo; Zephyr to Libra; Africus to Scorpio; Auster to Sagittarius—sometimes to Capricornus; Notus to Aquarius; and Eurus to Pisces.

(To be continued.)

THE official calendar of the University of Vienna for the winter session, 1905-6, announces that 386 separate courses will be given by 29 professors, 62 extraordinary professors, and 133 privatdozenten in the faculty of medicine.

ETIOLOGY OF PLAGUE.—In the *Indian Medical Gazette* of September, 1905, Major Browning-Smith, Chief Plague Medical Officer of the Punjab, criticizes Dr. Creighton's views that infective air rising from the ground and inhaled by man is the cause of plague epidemics. He brings forward five questions for answer which do not require to be dealt with here. As a matter of fact, the cause of the spread of plague—that is, the transference of the bacillus from man to man or from rat to man—is not yet accurately determined. It is quite conceivable that Creighton's opinion or idea would explain some of the cases of pneumonic plague—for example, the cases that occurred in the small outbreak in Vienna—but, of course, as Browning-Smith points out in his queries, it could not explain all cases, such as the bubonic types, nor the fact of one or two individuals living in a room getting the disease while others escaped. That the presence of the infection in rats precedes human epidemics is undoubted, but as to whether the flea is the transmitting agent is not proved. Though a rat flea may have bacilli alive and virulent for seven to eight days, as Zirolia of Rome affirms, it is not very clear how these are to pass into its proboscis and so into the wound inflicted on man. More investigations of a thorough and scientific nature are required to determine many of these points, and Major Browning-Smith, with his exceptional opportunities, may be able in the future to solve them.

The International Congress on Tuberculosis.

[FROM OUR SPECIAL CORRESPONDENTS.]

AFTER a week's work and feasting, the Congress held in Paris has come to an end, but not without some element of that sensationalism which appears to be the delight of the people of Paris. On October 5th the *Matin* published an article calculated to arouse the wildest hopes of all interested in the struggle against tuberculosis, in the shape of an announcement that Professor von Behring had discovered a "cure" for consumption, that the details would not be published for about a year, and that the greatest confidence could apparently be placed on the statement that the research would revolutionize the treatment of the disease. Together with this article was printed an extremely bad likeness of the Marburg bacteriologist. On the following day the report that von Behring had been prevailed upon to make his statement on the next day was freely circulated and published. Those who stood on intimate terms with a certain section of the Parisian bacteriological world may have gleaned some further information, but if that is so, they kept their secret well, for, in spite of theories and conjectures, no one seemed to have any idea of what Behring was going to say, save that his book was already in the press, and was decidedly voluminous. It was not difficult, however, to pick up several pieces of information, and, patching these together, to make out that the reason given for the announcement of his so-called discovery was not the question of priority, nor yet the pressure of others who had been following the development of the work, but lay rather in a desire of certain individuals to "squash" another work which seemed to be securing for itself a firm hold of the members of the Congress. If this conjecture is well founded, von Behring was approached and pressed to make the sensational statement, and, not being averse from a somewhat dramatic effect, consented, without actually being a party to any jealousy. But one must be very careful, especially after the way in which the French and English lay press has taken up the subject, to issue a solemn and loud warning not to accept indefinite statements, without even any experimental details. Von Behring failed to convince the majority of the scientists of Europe that he had done a great work when he delivered his address in Cassel, and it is not too much to say that if it were not for his name having become great in connexion with diphtheria antitoxin this work would not have aroused much notice. It has not been accepted, and therefore one fails to see how this new research, which is to a certain extent built up on the immunizing experiments, can be even provisionally accepted. Going a little further into the inquiry, we are given to understand that the active immunization, which he believed that he had previously produced, could be substituted by a passive immunization, and by means of these antibodies the curative process can be achieved. This of course applies to laboratory animals, such as guinea-pigs and rabbits; so that even if von Behring can show later, and others can confirm his work, that a true passive immunity can be produced on these animals, it does not by any means follow that the same applies to man. From this it may be inferred that it was premature of the Paris papers to speak of a cure of tuberculosis. It may therefore be pointed out that, as far as the material which von Behring has laid before us is concerned, there is no reasonable justification to anticipate any important progress in the treatment of tuberculosis.

THE ORGANIZATION OF THE CONGRESS.

Turning to the general impressions gained at the Congress, it may be said that, in spite of much careful preparation and organization, and in spite of the most propitious surroundings from a scientific point of view, there was much with which one could find fault, and which one would have liked different. In the first place, up to the end the Sections were often overcrowded, and little or no attempt was made to preserve sufficient silence to ensure that every one could follow easily. Next, an overwhelming number of the communications were merely repetitions of papers which had been read over and over again in other places, and which we suppose could only be given by the authors for the purpose of