

First of all we must take seriously these causes of the second degree, even though we believe St Thomas to have been mistaken on the point: we are concerned to discover not what we think but what he thought. To this end we give a number of citations for the purpose of driving home what is quite certainly St Thomas's thought yet constantly ignored.

Here are a few passages from the Meteorologicorum:

Quod autem inferior mundus regatur a superioribus corporibus et moveatur, probat duabus rationibus... (I, lect. II, §4.)

... sed ipsam naturam vel formam secundum quam naturaliter sunt calida vel frigida, a superiore corpore multo principalius recipiunt quam a generante: nam primum generationis principium est corpus caeleste.. (I, lect. IV, §5.)

... omnes enim formae corporum inferiorum reducuntur in corpora caelestia sicut in ~~primis~~ quaedam principia: et inde est quod diversa corpora caelestia diversos effectus in rebus corporalibus habent. (I, lect. V, §7; cp. Ia, 115, 3, 2m.)

... cum igitur ex solis motu causetur generatio et corruptio et omnes permutationes in istis inferioribus... (II, lect. II, §4.)

To cap off these citations we give St Thomas's answer to the query, What would happen if the heavens ceased to move?

Sed melius est dicere quod cessante motu caeli, omnis motus corporum inferiorum cessaret, ut Simplicius dicit: quia virtutes corporum inferiorum sunt sicut materialis et instrumentales respectu caelestium virtutum, ita quod non movent nisi motae. (De Caelo et Mundo, II, lect. IV, §13.)

This doctrine is not merely asserted in general: it descends to details.

Animals have an internal principle of movement. But they are not

the first causes of their movements: there are external agents such as the heavens and the ~~surrounding~~ surrounding atmosphere, and internal agents taken in through respiration and eating; these move the animal's internal principle of movement (In Phys., VIII, lect. XIII, §4.)

There is no such thing as momentum which keeps a projectile moving after it has left the hand: the continuation of its movement is due to the movement of the air caused by casting ^{the projectile} ~~it~~ (In Phys., VIII, lect. XXII, §10.)

Heavy objects naturally fall. But their internal principle of gravity is not an active but a passive principle. They are as much moved by the heavenly bodies as anything else. (In Metaphys. V, lect. XIV; In Phys., II, lect. I, §4; VIII, lect. VIII, §7.)

On the other hand, the human intellect and will since they are spiritual principles are not moved except per accidens by the heavenly bodies (Cont. Gent., III, 87; Ia, 115, 4.).

None the less, every motion that we perceive is virtually the motion of the utmost sphere and primum mobile. This St Thomas asserts when working out the theory of time he sets himself the difficulty: if time is a consequence of motion, there are as many times as there are motions; accordingly there is no simultaneity. He writes:

Ad huius igitur scientiam intelligendum est evidentiā sciendum est quod est unus primus motus qui est causa omnis alterius motus. Unde quicumque sunt in esse transmutabili, habent hoc ex illo primo motu qui est motus primi mobilis. Quicumque autem percipit quemcumque motum, sive in rebus sensibilibus existentem sive in anima, percipit esse transmutabile et per consequens percipit primum motum quem sequitur tempus. Unde quicumque percipit quemcumque motum percipit tempus, licet tempus non consequatur nisi unum primum motum a quo omnes alii causantur et mensurantur; et sic remanet unum tempus (In Phys., IV, lect. XVII, §3.)

This Einsteinian passage shows the profundity of St Thomas's thought on time; but it also shows what he thought on the causation of motion. All the motions we perceive in external bodies, in our own bodies, or in the soul, which is moved per accidens ~~by~~ the body, are virtually perceptions of the motion of the primum mobile.

Finally the different heavenly spheres hierarchically participate one another's motion to produce various effects on the earth.

First there is the perpetual diurnal motion and this is the cause of semper esse similiter.

Second there is the zodiacal motion, the motion of the seasons, and this is the cause of esse aliter et aliter.

Videmus enim quod ea quae appropinquante sole ad nos generantur, recedente sole corrumpuntur: sicut herbae quae in vere nascuntur et in autumnno siccantur (In Metaphys., XII, lect. VI.).

But each planet has its special assignment. The three superior planets act in regard to existence. Saturn effects ipsa stabilitas esse rei; Juppiter effects perfectio rei et bona habitudo; Mars gives the virtus rei propellans nociva. ~~Etiam sunt in aethere universales producatum motus~~
The lower planets act in the accidental order. The sun is the universale principium motus; Venus takes care of the species; Mercury has his variety of movements to produce multiplicity and diversity within the species; the moon finally attends to the dispositio materiae ad accipiendum omnes impressiones caelestes. (See In Metaphys. XII, lect. IX.)

St Thomas then believes in the existence of generic causes. He also has a theory of the generic cause and to this we must now turn our attention.

First comes the distinction between the natural and the intellectual agent. The action of a natural agent is proportionate to to its nature: tanta enim procedit calefactio quantum est calor. The action of an intellectual agent is proportionate not to his nature but to the form he apprehends: a builder does not build all he can but he builds according the plan he conceives (In Phys., VIII, lect. XXI, §10.)

Next there is the hierarchy of the natural proportions.

Manifestum est enim quod quaelibet virtus extenditur ad aliqua secundum quod communicant in una ratione objecti; et quanto ad plura

extenditur, tanto oportet illam rationem esse communioem; et cum virtus proportionatur obiecto secundum eius rationem, sequitur quod causa superior agat secundum formam magis universalem et minus contractam.

Et sic est considerare in ordine rerum: quia quanto aliqua sunt superiora in entibus, tanto habent formas minus contractas et magis dominantes super materiam quae coarctat virtutem formae. Unde et id quod est prius in causando, invenitur esse prius quodammodo secundum rationem universalioris praedicationis; ut puta si ignis est primum calefaciens, caelum non tantum est primum calefaciens sed primum alterans. (In Phys. II, lect. VI, §3.)

This brings us back to our starting-point: the distinction between the generic causes of the second grade and the particular causes of the third grade. The heavens are the causes of change, esse aliter et aliter; but to be heated is a particular instance of being changed. How then do the heavens combine with fire to heat something? The way a man combines with his pencil to write something. The man moves the pencil and the pencil marks the paper: the pencil is the cause of the deposition of particles of lead on the paper; the man is the cause of the transference of the particles from the pencil to the paper. Again just as the pencil could not write anything unless moved by a man, so fire could not heat anything unless moved by the corpus caeleste: quantumcumque ignis habeat calorem perfectum, non alteraret, nisi per motionem corporis caelestis (1a 2ae, 109, 1).

Now though it may not be very clear just how the corpus caeleste does all this, that is not the point. Once it is admitted that the diurnal and zodiacal motions are the causes of all motion and change, the rest follows necessarily: for what is moved by something else is the instrument of the something else as St Thomas asserts in proving the impossibility of an infinite regression (In Phys. VIII, lect. IX, §5.)

Further Aristotle and St Thomas had excellent reasons for asserting that everything is moved by the heavens. If we turn to the Physics

(bk. VIII, lect. XIV - XVI) we find it argued that any case of substantial change, augmentation or diminution presupposes alteration, that any case of alteration presupposes local motion. Now there is in the terrestrial world continuous generation, corruption, augmentation, diminution and alteration. ~~Whence~~ To cause this there must be perpetual local motion. Now nothing that is generated nor corrupted can be the cause of perpetual local motion: no single instance of such things, for no single instance is perpetual; no aggregate of things generated and corrupted, for an aggregate will not account for the process as a whole: ~~Whence~~ the perpetuity and continuity as such have to be caused or else the effect is accidental. But to assert either that the effect is accidental or that the continuity and perpetuity is not natural is simply preposterous. Therefore the effect is due to the heavenly bodies.

There is only one error in this argument. The error is that local motion as a constant velocity is not conceived as essentially distinct from local motion as an acceleration. For on that point, though ~~hence~~ this is not the place to argue it out, I believe there is no alternative to the Aristotelian theory of the universe and the Newtonian or similar theories: for if local motion as such, that is, change of place without other change, for example, of energy or momentum, is a transition from imperfection to perfection, from potency to act, then there must be imperfect places and perfect places, and the whole Aristotelian theory follows; but if places are indifferent, then change of place as such is not a transition from potency to act but simply being in a peculiar kind of act; local motion becomes a state, and the Newtonian type of theory follows. This much is said to show that St Thomas's position on the influence of the heavenly bodies is far more reasonable than that of the cosmological manuals that hold all places to be indifferent and yet define local motion as a transition from potency to act.