COMMENTARY ARTICLE

Black Bile, Manic Depression and Melancholy: Two Pillars of Our Understanding

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ABSTRACT

I aim to demonstrate the movement of the argument of the Aristotelian Problem XXX.1 as it illuminates the phenomena of melancholy, which it is argued is more rightly understood as manic depression, and black bile. The discussion will aid contemporary researchers in psychiatry as well as those in ancient philosophy and medicine. An appeal to both Emil Kraeplin and the Aristotelian author will demonstrate surprising resonances. An appeal to Aristotle's discussion of anger in the De Anima will make clearer what is at stake in Problem XXX.1.

I. Introduction

It is my aim to introduce an Aristotelian discussion to the modern-day psychiatrist while also acquainting those who study Ancient philosophy and medicine with a psychiatric perspective. To pursue this multi-faceted approach, I offer a careful reading of an Aristotelian text, *Problem* XXX.1, concerned with the condition of melancholia; special care is given to the way in which the argument unfolds. Such an approach provides a richer understanding of the interstitial spaces. Because the "authorship of the Problems, and its famous and influential discussion of melancholy, is in considerable doubt" (Radden 2000, p. 55), I will use "the Aristotelian author" to describe the one responsible for its writing. I argue that it is the same phenomenon under discussion by Emil Kraepelin, a 19th and early 20th Century thinker often considered one of the founders of modern psychiatry. While there is much enthusiasm for Kraepelin's work, there are questions about his attachment to race hygiene and eugenics (see, for example, Eric J. Engstrom (2007). In considering the treatment of this phenomenon in the Aristotelian *Problems,* I will also turn to Aristotle's canonical work *De Anima,* which suggests an interplay between final and material causes at the heart of the analysis. The three-fold nature of this project makes my reading of the Aristotelian *Problem XXX.1* unique.

II.

The Aristotelian *Problem XXX.1* starts provocatively enough:

Why is it that all those men who have become excellent (*perritoì*) in philosophy, politics, poetry, or the arts are clearly (*phaínotai*) melancholic, and some to such an extent that they are seized by the illnesses that come from the black bile, as is said in connection with the stories about Heracles among heroes? (953a10-15).[1]

It is worth trying to figure out how the argument proceeds to take several turns before reaching a kind of conclusion. While van der Eijk (2005) makes many interesting points, he does not, like some others (e.g Pies (2007)), recognize the changeability, the manic depressive quality of the melancholic (pp. 155-160). We are to think of philosophers, poets, artisans, and statesmen as suffering from melancholia. But if we think of melancholia simply as something to do with dark and gloomy thoughts, we partially miss the mark. After recognizing, in my original reading of *Problem XXX.1*, what seemed to be a description of the manic depressive, I later came upon the work of Emil Kraepelin and immediately connected the account in the *Problems* with his *Manic-Depressive Insanity and Paranoia*. I subsequently discovered that I was not the first to see manic depression as the phenomenon under consideration. In a very fine piece, Pies (2007) offers a view of *Problem XXX.1* from a psychiatrist's point of view. He cautions that "…there is always the possibility that what these early observers described was not, in fact, bipolar disorder as we understand it, but some other kind of emotional disturbance—the result, say, of intoxication, cerebral infection, or epileptiform psychosis" (p. 8). His argument, near its conclusion, compels him to claim that "…the Author of *Problemata XXX* must have been describing some variation of today's bipolar spectrum and not merely the separate existence of depressed and manic mood

[1] Radden (2000) notes that each of the claims here can be challenged on the basis of insufficient assumptions (p. 55).

states" (p. 10). Northwood (1998) mentions the possibility of understanding the melancholic in terms of manic depression (p.7), but makes little use of this connection**.** Speaking of the great first century physician Aretaeus, Flashar (1966) points out that he is devoted to "showing that mania constitutes the aroused, melancholy the depressive form of derangement, but to display the connection which exists between the two oscillating curves in reversing from one mood to the other. The reversal for Aretaeus signifies an intensification more than a change in the illness" (quoted in Tellenbach, 1961, p. 3).

III.

While we will get the Aristotelian author's examples of philosophers, poets and statesmen said to be melancholic while excellent,[2] we also have the heroes like Heracles and Ajax. We learn from Sophocles' *Ajax*, that before taking his own life,[3] Ajax killed a number of sheep and oxen thinking that they were his enemies; he is described as being in a "diseased delusion" while performing the deed (*Ajax* 58). The play suggests that the delusion was brought on by Athena, but *Problem* XXX.1 leads us to think of it as a problem of bile. The gods are replaced by material causes. As the argument unfolds, however, we see that it is not simply the presence of black bile, but effects of heat, cold, and breath that play a role. We are told about the eruption of sores, which points to the connection between the visible and invisible through a bodily manifestation of some internal condition.

While the emphasis seems to be on what we might call material or mechanical causes of behavior, *Problem* XXX.1 implicitly raises a question about a possible distinction between "nature" (*phúsis*) and body. After Heracles is described as having been of the melancholic nature (*tês phúseôs*) (953a18), Empedocles, Socrates and Plato are said to have suffered in the same way (*homiopatheîs*) as the heroes. The Aristotelian author explains: "For in many such men diseases have come from this sort of mixture in the body (*tô sômati*), whereas in others their nature (*ê phúsis*) clearly inclines toward these passions" (953a30-32). A mixture in the body stands in contrast here to "the nature" of some of those affected. Could "*phúsis*" be standing in for soul or at least supplementing the materialistic slant of the opening by pointing to formal cause?

We are led to ask, then, whether the Aristotelian author views the melancholic temperament as a condition of soul. Do matters like bile, heat and breath inform our understanding of soul? The discussion of anger in Aristotle's *De Anima* provides a helpful way to understand a causal nexus:

> But the one who studies nature and the logician would define each attribute of the soul differently, for instance what anger is. The one would say it is a craving for revenge,

[2] What here is translated as "excellent" is the Greek work *perritos*. Of this Northwood (1998) notes that "*Perritos* commonly meant 'above or more than the average or the common,' and thus could have either positive or negative connotations—extraordinary or outstanding when used positively, and monstrous, superfluous or excessive when used negatively" (p. 3). In taking a broader view of the history of melancholy, Radden (2000) notes that "The link with genius was also revived in the literary movement of the late eighteenth and early nineteenth centuries. Again the suffering of melancholy was associated with greatness; again it was idealized, as inherently valuable and even pleasurable, although dark and painful" (p. 15). Radden (2000) seems to emphasize the monstrous aspect of the melancholic. For *perritoi*, see also Tellenbach (1961, p. 10). Tellenbach (1961) notes that "…one can easily discover that the Aristotelian conception of an original tie of genius with melancholy has remained a living part of the history of ideas up to the present" (p. 11).

[3] Suicide seems to be one consequence of the irrational despondency of the bile being colder than is fitting (954b30).

> or some such thing, while the other would say it is a boiling of the blood and heat around the heart (403a29-403b).[4]

The proper account of something like anger would apparently include both the final cause (the desire for something) AND the material account (the boiling of the blood). If melancholia is simply treated mechanistically in *Problem* XXX.1**,** one might question the completeness of the account or its authorship. However, the Aristotelian author could be understood as suggesting that a desire for greatness in the arts, philosophy and politics is the final cause, the end towards which the melancholic manic depressive strives. This would be a way of indicating a link between material and final cause that determines the attribute of melancholy, understood as manic depression.

IV.

There is no simple statement in the text that defines melancholy; it comes into focus, rather, through the unfolding of the argument. We are invited to think of melancholia by means of an example or paradigm (*paradeígmatos*) (953a33)**,** turning to wine in order to better understand the causes of this condition. Wine, we are told, produces most of the characteristics (*pleîsta êthê*) of the melancholic (953a36). Kraepelin provides us with a helpful suggestion: "The disorder [manic depression] might to a certain degree conform to that which we can produce artificially by alcohol; from this arises the great similarity of many manic patients to light or heavy drinkers" (p. 26). Kraepelin notes the similarities of intoxication with manic depressive insanity, just as the Aristotelian author does with melancholy. These characteristics include irascibility, philanthropy, compassion and recklessness (953a37). With respect to irascibility, Kraepelin remarks that

> …we meet with a peevish, insufferable, dissatisfied and grumbling mood. The patients are discontented with everything; they loathe the whole world; everything torments, annoys, irritates them, fills them with bitterness, the sunshine, people enjoying themselves, music, everything done or left undone in their surroundings. These moods are most frequently found in the periods of transition between states of depression and mania; they are, therefore, probably most correctly regarded as mixed states of depression and manic excitability (p. 25).

The effects of wine vary based on the level of intoxication. Those who are by nature, and not by intoxication, melancholic likewise prove to be variable in character (954b9). It is because black bile is inconsistent or anomalous, that the melancholic by nature are as well (955a30-33).[5] This characterization is a refinement of the understanding of one individual being talkative while another individual is agitated or prone to tears (953b9-12). Just as the individual who is drinking changes through certain stages, so too does the melancholic

[4] In an excellent analysis, van der Eijk (2005) examines the way in which melancholia is used in works of the Aristotelian corpus (esp. pp. 144ff.) The analysis of the occurrence of melancholics in the *Nichomachean Ethics* strikes me as particularly insightful.

[5] Pies (2007) notes that "This humor or stuff he calls 'black bile' is far more protean than it seems at first glance" (p. 9). He later writes that "…one and the same melancholic individual is capable of showing great extremes of mood" (p. 10). The notion of the "protean" character captures what the Aristotelian author and Kraeplin are describing in their own terms.

change. We will have to understand better the mechanisms by which this occurs. At this early point in the argument, it seems as if behaviors are fixed in an individual: "…for some people are bold, others silent, others compassionate" (953b20-21). Something in the argument must change to allow for the recognition of the inconsistent or anomalous character within an individual, perhaps in particular what Kraepelin described as a mixed state.

A new layer of the argument is uncovered in our search for causes when heat is introduced (953b23). No sooner is heat introduced, though, that we get breath (*pneumatiká*) (953b23). We initially thought that wine served as a paradigm for melancholia because the effects of the two were similar; now we achieve a deeper understanding when we are told that black bile and wine both contain breath (955b24), and this is the reason that they are similar in nature (953b27).

The role of breath in connection with wine and the melancholic explains the sexual character of the two: Dionysus, the god of wine, and Aphrodite, the goddess of love and sex, are connected by means of breath (953b32). Most of those who drink become amorous if not exceeding a certain level of intoxication; likewise, most melancholics are lustful (*lágnoi*) (953b33). In periods of hypo-mania, being lustful can be said of the manic depressive. Kraepelin observes that "Sexual excitability is increased and leads to hasty engagements, marriages in the newspaper, fondness for dress, on the other hand to jealousy and matrimonial discord" (p. 22). As a kind of footnote to the discussion of breath, sexual intercourse and lust, the Aristotelian author notes that the "majority of melancholic people are thin, and their veins stand out" (954a6). Just as the melancholic is marked by the eruption of sores, a thin body is an outward manifestation of the condition. Kraepelin remarks that body-weight "always falls very considerably in acute mania" (p. 45).

V.

We initiate a new beginning of sorts, and sense how the argument is developing, with the introduction of cold. There is some confusion when thinking about heat, cold and black bile. On the one hand, we are told that the melancholic humour is a mixture of the hot and the cold (954a13); on the other hand, black bile is said to be cold by nature (954a22).[6] One could imagine the Aristotelian author using as an example for the point about black bile something like the specific heat of gold, which does not require much energy to heat or cool it. If this is along the right lines, black bile would be affected by a little disturbance. It could be thought of as a volatile material substance, which might allow us to understand it as a mixture of heat and cold while describing it as cold by nature. I take it that characteristics like spiritlessness or fearfulness when the black bile is cold and, in contrast, high-spiritedness and insanity (*ekstasis*) when overheated are applied to the same person at different times. As Kraepelin notes:

> Accordingly we distinguish first of all manic states with the essential morbid symptoms of flight of ideas, exalted mood, and pressure of activity, and melancholia or depressive states with

[6] This seems close to the Hippocratic notion that black bile is dry and cold (van der Eijk (2005 p. 143) and Flashar (1966 p. 39). On the other hand, van der Eijk argues that "Therefore, both in its thought and in its terminology the Aristotelian concept is such a far cry from the Hippocratic theory of four humours that one can hardly speak of Hippocratic *influence*" (p. 154). This prepares us for the claim that "…it is virtually impossible to say anything with certainty on the sources of Aristotle's concept of melancholy" (van der Eijk (2005, p. 155).

> sad or anxious moodiness and also sluggishness of thought action (pp. 3-4).

While wine provides heat to those drinking it, it is not clear what the source of heating or cooling is for those melancholic by nature. "In most people," says the Aristotelian author, "therefore, arising from their daily nutrition, it produces no differences in character, but only brings about some melancholic disease" (954a26-28). This seems to imply that food and drink supply the heat for the bile. Are we to assume that the supply of heat for the naturally melancholic is likewise provided by food and drink? Or is there an internal source of energy? Is there something like a self-heating and self-cooling bile? In contrast, one might speculate that the desire for greatness or excellence would provide the motivation that is somehow linked with this thermal condition.

Coldness of the bile produces madness or apoplexy (*apoplêxias*) (954a26). We normally think of heat as being associated with anger, as in the case of the boiling of the blood in the *De Anima*, but with that, perhaps madness or apoplexy as well. One might wonder, then**,** about the claim that coldness elicits these effects.[7] Chilling of the bile is also said to cause torpor or spiritlessness or fear, while an overabundance of heat causes high-spiritedness and insanity (*ekstasis*) (954a26). Once again we have a claim about material causes of what we might call passions of the soul or mind. On *De Anima*'s model of explaining passions of the soul, this is to give a partial account of the causes of the phenomenon.[8] That is, if we cannot discern the love of excellence as a final cause.

In periods when black bile is over-heated, people become manic (*manikoì*),[9] clever, erotic[10] (*erôtikoì*) and moved easily to spiritedness and desire (*eukínêtoi pros tous thumoùs kaì tàs epithumías*) (954a32-34). Maracuse of Syracuse was said to be a better poet in a state of over-heated black bile, perhaps to the point of being thumotic (spirited) and erotic. In periods of acute mania, Kraeplin observes that "Mood is unrestrained, merry, exultant, occasionally visionary or pompous, *but always subject to frequent variation*, easily changing to irritability and irascibility or even to lamentations and weeping" (p. 63, emphasis added). Being vulnerable to "frequent variation" recalls *Problem XXX.1*'s emphasis on the inconsistent or anomalous character of the melancholic.

VI.

It perhaps comes as a surprise to hear that it is those whose black bile approaches a mean (*pros tò meson*) who are melancholic (954b1-2).[11] I take it that the Aristotelian

[7] Kraepelin acknowledges that patients in depressive states can be "repellent, irritated, angry, inclined to violence" (p. 94).

[8] Overheating, at the same time, causes an eruption of sores (954a26), highlighting again how the warmth of the black bile is made visible in ways not simply behavioral.

[9] van der Eijk (2005) notes that words associated with melancholy sometimes seem to "mean virtually the same thing as *manikos* ('mad') or *mainethai* ('be mad')" (p. 140-141).

[10] The melancholic is said to be lustful, as we have seen. They become erotic when the bile is over-heated. Perhaps the Platonic Socrates and the Aristotelian author differ with regards to eros; such an examination would be to go beyond the limits of this small study.

[11] My view is in line with the one offered by Northwood (1998) (p. 3). Radden (2000) frames the issue in the following way: "The Aristotelian author assumes that excess of black bile results in melancholia and more severe states of mental disorder, while a lesser and more stable imbalance of humors with additional black bile produces the melancholic temperament or disposition" (p. 56). "Stable imbalance" is a striking formulation. It is well worth

author means properly melancholic, speaking, presumably, of those who have reached a state of equilibrium; but why is this not the normal state of human beings is not entirely clear?[12] Hot but not too hot seems to be the ideal state and makes "sufferers" of melancholia different from others in terms of education or politics or the arts (954b3-5).[13] The introduction of education seems to be a new, unexpected element of the argument. In contrast to the original list associated with melancholy—philosophy, politics, poetry and the arts (953a11)—this claim about the mean condition leaves out philosophy and poetry. Do those two in fact require a condition beyond the stability of the mean?[14] The suggestion, in any case, of a state of equilibrium (stability?) is put into question by the melancholic mean in moments of fear: "And in the face of danger, such a state [the melancholic mean] produces great variation because many of the men are sometimes inconsistent [anomalous] in the presence of fears" (954b5-7). The melancholic mean, in the face of fear, produces, not equilibrium (uniformity and balance?) but great variation.

Almost immediately after laying out the melancholic mean, we are presented with a refinement emphasizing inconsistency:

> Now the melancholic mixture is itself inconsistent, just as it produces inconsistency in those with the (melancholic) diseases; for like water, it is sometimes cold and sometimes hot (954b8-11).

The level of heat of the bile makes one react differently to different fearful situations. If we are to imagine the state of the bile preceding the experience of confronting something judged as fearful, what accounts for the coldness or hotness of the bile is still undetermined.

But this is not quite right. The fear produced by the perception of something fearful can influence the level of heat of the bile.

> So when something fearful is announced, if it happens when the mixture is colder, it makes the person cowardly for it paves the way to fear, and fear cools. Those feeling great fear prove this: for they tremble. But if the mixture is hotter, the fear brings it down to the moderate level, and (makes the person) in possession of himself and unaffected (954b11-15).

Some desire, either to flee or to act courageously, might be understood to play the role of a formal cause, on the model of anger in the *De Anima*. This would give another possible answer to the question as to whether there is an external or internal cause of thermal disturbance. If the bile of the melancholic is hotter than the mean, a fearful event will temper that heat, drawing the person to the mean.[15]

Non-melancholic people often experience moderate highs and lows

asking, Is the mean something solid through time? I will discuss this below.

[12] Northwood (1998) puts the problem this way: "The healthy somatic ideal, however, was conceived by Greek medical theorists as the equality of the humours either with respect to their quantity or their relative strengths (quality); disease was by definition an excess of one of the humours or elements. If the ideal state with respect to the humours was equality or isonomic proportion, but 'all those who have become eminent in philosophy or politics or poetry or the arts..' be melancholics, then which state is the ideal—health or melancholia? (p. 1). van der Eijk (2005) notes Aristotle's claim in *Parts of Animals* that not all people possess bile (p. 152).

[13] Northwood (1998) calls this the "Just a little off the mark" model (p. 4). Pies (2007) terms this the "humoral 'Goldilocks' effect" (p. 10).

[14] It was a reference to the excellence of the poetry of Maracuse as a result of over-heated bile that immediately preceded the introduction of the mean and this partial list.

[15] Northwood (1998) reasons: "…it would seem plausible that having a cool disposition in the face of

(954b16-17); these affections are said to be superficial or small (954b20). "But those in whom they are deep," the Aristotelian author continues, "these people are already this type with respect to their character (*êthê*)" (954b21-22). The melancholic have a certain character, they are a particular type of human being.

It is perhaps surprising that we are presented again with a contrast: "For if their condition is quite saturated (*katakorês*) they are very melancholic, whereas if it is mixed in a certain way, they are extraordinary" (954b26-28). I take it that "saturated" means here by cold or by heat. If the bile is predominately or significantly cold, that person will be in a stupor or irrationally despondent or in a deep depression.[16] In contrast, if the bile is super-heated, mania or insanity will be the result. The very melancholic is either unusually high or abnormally low. For the cold bile, there are strong fears or spiritlessness or stupor (954b31; 955a15). Kraepelin describes this condition:

> In the highest grades the psychic inhibition described may go on to the development of a marked stupor. The patients are deeply apathetic, are no longer able to perceive the impressions of the surroundings and to assimilate them, do not understand questions, have no conception of their position (p. 79).

Suicide seems to be one consequence of the irrational despondency that is associated with the bile being colder than is fitting (954b30). Speaking of the depressive state, Kraepelin remarks that "Life appears to him aimless, he thinks that he is superfluous in the world, he cannot restrain himself any longer, the thought occurs to him to take his life without his knowing why" (p. 76). Something like an unconscious desire for self-destruction would play the role, once again, of a formal cause (final cause?), which stands in some relation to material causes.

The opposite extreme would be a state of too much recklessness or boldness (954b23) or cheerfulness (955a1). The presence of these two poles suggests that the Aristotelian author is describing the manic depressive.[17] Kraepelin once more fills out the picture:

> …the ideas of greatness, which not infrequently accompany the manic state, often bear more the stamp of half jocular swaggering and boastful exaggeration, which also in contrast to the depressive ideas for the most part uniformly adhered to, change frequently, emerge as creations of the moment and again disappear (p. 21).

This offers a way in which to formulate the anomalous or inconsistent character of what is called the melancholic in *Problem XXX.1*.

Wine had been used as a paradigm for the melancholic. Now, at this moment in the unfolding of the argument, it is examined for

very hot environmental influences would be beneficial in that, like the case of the hot disposition facing the cooling effects of fear, a moderate temperature will ultimately result" (p. 5). She uses Socrates as an example of having a cool disposition (p. 6). Having a cool disposition would, paradoxically, begin with a bile that is hotter than normal.

[16] Radden (2000), commenting on this and similar passages, remarks that "The account of melancholy in this passage probably traces to Hippocrates' comment that melancholia is signaled by prolonged (and thus, presumably, unwarranted or groundless) fear or sadness" (p. 57). In contrast to the position I am arguing for, Radden does not see the incredible variation of the moods of the melancholic.

[17] Pies (2007) remarks: "I do not believe that the modern psychiatrist can read these passages without being struck by how close Aristotle's description come to those of hypomania (cheerful, clever, amorous, more talkative) and mania (madness or frenzy)" (p. 3).

the effects it has on the melancholic: "And some melancholic people continue to be spiritless after drinking; for the heat of the wine extinguishes the natural heat" (*tên phuikên thermotêta*) (954b38-955a). This should strike one as paradoxical. One type of heat snuffs out a more natural form of heat. The Aristotelian author might counsel against drinking wine for the melancholic, even for the melancholic in a mean state. Just as fearful situations were found to alter the ratio of hot and cold of the bile, so too is wine an external cause (955a17). But we are still left without a suggestion as to whether there is some internal mechanism by which the black bile achieves a mean or is thrown into disequilibrium.

Near the end of the work, we are left to wonder about the possibility of achieving a mean: "So to sum up, because the power of the black bile is uneven (*anômalon*), melancholic people are uneven; for (black bile) becomes both very cold and very hot" (955a30-32). If a mean is ever achieved, it must by nature be short-lived. Stepping back, perhaps, from a focus on the melancholic, the Aristotelian author claims that the hot and the cold are character forming (*to êthopoiòs*) (955a33). This starting point for a mechanistic account looks hard to reconcile with something like the well-known claim of Aristotle's *Nichomachean Ethics*, that character is formed by means of habituation. Can one argument serve to supplement the other?

Problem XXX.1 ends on a puzzling note:

> But since it is possible that what is uneven is well tempered and in a fine condition (*kalôs*), and when it should be the disposition is hotter and then again cold, or the opposite owing to there being an excess, all melancholic people are extraordinary, not owing to disease but owing to nature (955a37-40).

It seems as if it is precisely the back and forth between the hotness and coldness of the bile that makes the melancholic extraordinary. This is to refine our conception of the possibility of a mean condition.[18] The condition of the melancholic is one of a significantly unstable equilibrium and the possibility of any long-lasting mean condition is highly questionable. While one could imagine this disequilibrium to be exhausting, some kind of creative energy can apparently be produced by such a movement. The Aristotelian author does not develop this point, but only indicates it by identifying the melancholic with those who have become excellent in philosophy, politics, poetry, or the arts. The focus of this text is the physiology of the melancholic, the set of material causes that are responsible for the psychological condition. But read in light of Aristotle's *De Anima*, those conditions could be linked with a final cause in the desire for excellence, which motivates those who excel in philosophy, politics, poetry or arts.

[18] Northwood (1998) speculates that the "…favorable melancholic state *is* a mean of sorts, and not just a state that is close to the isonomic mean; the variable melancholic state is here described as *eukraton*—good mixture, indeed, an adjective often used in medical treatises to describe the blending of the humours or elements constitutive of the state of health" (p. 4). She acknowledges, however, that this is, in part, inadequate: "…the favourable melancholic constitution appears to have wide fluctuations in the heat of its black bile" (p. 4).

References

Aristotle. *De Anima*, translated by Joe Sachs (2001), Green Lion Press, Santa Fe, NM.

Engstrom, Eric J. 2007. "On the Question of Degeneration" by Emil Kraeplin, *History of Psychiatry*, 28(3): 389-404.

Flashar, H. 1966. Melancholie and Melancholiker in den medizinischen Theorien der Antike. Berlin.

Northwood (1998), H. 1998. "The melancholic mean: the Aristotelian mean: the Aristotelian Problema XXX.1." Presented at: the Twentieth World Congress of Philosophy; Boston, MA; August 10-15, 1998. Accessed 10 May 2019 http://bu.edu/wcp/Papers/Anci/AnciNort.htm.

Pies, Ronald. 2007. The historical roots of the 'bipolar spectrum;' Did Aristotle anticipate Kraepelin's broad concept of manic depression. Journal of Affective Disorders Volume 100, Issues 1–3, Pages 7-11.

Radden, Jennifer. 2000. *The Nature of Melancholy: From Aristotle to Kristeva*. Oxford University Press, Oxford.

Sophocles. *Ajax*, translated by John Moore (1957), University of Chicago Press, Chicago, IL.

Telenbach, Hubertus. 1961. *Melancholy: History of the Problem, Endogeneity, Typology Pathogenesis, Clinical Considerations*, translated by Erling Eng, Duquesne University Press, Pittsburgh.

van der Eijk, Philip. 2005. *Medicine and Philosophy in Classical Antiquity: Doctors and Philosophers on Nature, Soul, Health and Disease*. Cambridge University Press.

