Homeostasis and the Mean in Aristotle's Ethics

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All influences need to be counterbalanced
so that they may be reduced to
moderation and ... the mean ...
(*PA* 656b16-18)

I A Physiological Approach to Aristotle's Doctrine

Several earlier twentieth-century writers on Aristotle's ethics claimed to have discovered within his doctrine of the mean the practical expression of a theoretical idea prominent in his physics and biology: that of a stable blend (*krasis*) of opposed powers as determined by a fixed ratio.[1] According to this view, virtue, being an intermediate state of character, expresses an analogous blend or unity, one that is the product of contrary motivational tendencies. On the other hand, most contemporary writers pay little or no attention to this interpretation,[2]

1 See esp. *The Ethics of Aristotle*, ed., John Burnet (London: Methuen 1900), 69-72; also E.H. Olmstead, 'The Moral Sense Aspect of Aristotle's Moral Philosophy', *American Journal of Philology* 69 (1948) 42-61; W.J. Oates, 'The Doctrine of the Mean', *The Philosophical Review* 45 (1936) 382-98; Theodore Tracy, *Physiological Theory and the Doctrine of the Mean in Plato and Aristotle* (Chicago: Loyola University Press 1969), IV; and more recently, Stephen C. Clark, *Aristotle's Man: Speculations upon Aristotelian Anthropology* (Clarendon Press: Oxford 1975), 84-97.

2 See Julia Annas, *The Morality of Happiness* (Oxford: Oxford University Press), 59-61; also Charles Young (on whom Annas' account partly relies) 'Aristotle on Justice', in *Aristotle's Ethics*, Proceedings of the Spindel Conference 1988, *The Southern Journal of Philosophy* 27 (1988), Supplement, 233-49; and his 'Aristotle on Temperance', *The Philosophical Review* 97 (1988) 521-42. For a concise critical presentation of difficulties contained in the idea of virtue as a blend, see W.F.R. Hardie, *Aristotle's Ethical Theory*, second edition (Oxford: Clarendon Press 1980), 143-51.

claiming that it is at odds with Aristotle's general definition of virtue as well as with parts of his discussion of the individual virtues.

Although I agree with this last claim, I believe that it has prevented our discovering an alternative and more rewarding application to Aristotle's ethics of the idea of unity of opposition. This alternative view concerns the role that homeostasis plays in his account of the psychophysiology of emotion. According to Aristotle, virtue demands that a person be able to exhibit different emotional responses in different social settings, taking care to avoid the extremes of deficiency and excess. The value of the idea of homeostasis, as we shall see, is that it explains how a single physiological system can continually vary its activity in order to accomplish such specialization, while preserving its overall integrity. My aim, then, is to show how this idea enables us to view Aristotle's doctrine of the 'mean relative to oneself' (*mesotēs kath'hauton hekaston, EE* 1222a) as a perfected version of one's own characteristic psychophysiology.

This thesis may at first seem unusual to us, since we tend to regard ethics and physiology as wholly different disciplines. It is also difficult to know exactly how to go about the task of trying to combine them. For whereas the former centers on our ability to choose how to live, the latter is largely concerned with biological processes over which we have little control. Yet I believe that Aristotle's writings strongly suggest that the two disciplines can actually complement each other. To explain their special relationship, I locate Aristotle's account of the emotions, the subject-matter of his doctrine of the mean, within the framework of the teleological physiology found in certain of his biological writings, including the *de Partibus Animalium* and the shorter treatises of the *Parva Naturalia*. I also show how this physiological view of emotion enhances, rather than undermines, our understanding of the kind of character modification Aristotle thinks is necessary to bring our emotions in accord with the mean: that of aiming at the extreme farthest from the one toward which we, as individuals, usually aim. Finally, I comment briefly on the philosophical significance of the claim that the emotions are a part of the subject-matter of ethics because of, and not (as is often thought) despite, their physiological dimension.

II The Traditional Interpretation

We cannot question the importance of the idea of a blend of opposing elements as it applies to Aristotle's physics and biology; its application to his moral theory, as already noted, is another matter. Why, then, think that the idea *can* be fruitfully applied in this second area? One answer that a defender of the previous interpretation might offer is that such an idea can help explain an otherwise puzzling feature of Aristotle's doctrine of the mean. According to this doctrine, what distinguishes a virtuous from a non-virtuous state of character (*hexis*) is that the former is intermediate in relation to two opposed vices: those of excess and deficiency. This doctrine, however, prompts us at once to ask, 'Intermediate in what sense?' The answer that defenders of the interpretation in question give is that the intermediate signifies a blend or integration of opposites, i.e., of contrary motivational tendencies, combined in proper proportion. For example, courage is a mean, according to this view, since it appropriately combines the contrary feelings of fear (*phobos*) and confidence (*tharros*) (*EN* 1107a33, 1115a6-7, *EE* 1228a36-7), whereas cowardice and rashness represent quantities of these two feelings whose combination produces different and inferior sorts of blends. Thus, just as the qualitative properties of a chemical blend (*krasis*) are a function of the quantities of its individual elements, the qualities of a specific character state are similarly dependent on the quantities of its individual feelings.

Unfortunately, there are three serious difficulties with this interpretation. First, the motivational structure of courage is unrepresentative of the other virtues, which, for the most part, do not combine contrary motivational tendencies. The reason for this difference, as David Pears[3] has pointed out, is that, unlike other Aristotelian virtues, courage requires a person to evaluate two distinct objectives rather than a single one: the likelihood of her own death and the attainment of her overriding purpose.

Second, even in the case of courage, the present interpretation is suspect. For while it is perfectly acceptable for us to say that courage is a combination of fear and confidence, it is doubtful whether we can also regard these feelings as constituting a blend or unity in the sense that the

3 See his 'Courage as a Mean', in Amelie Rorty, ed., *Essays on Aristotle's Ethics* (Berkeley: University of California Press 1980), 171-87.

present interpretation requires. The difference, it seems to me, is that in the case of mere combination it is possible to specify the proper amount of a given contrary independently of its opposite, whereas this is not possible in the case of a genuine blend or unity.[4] Thus the right amounts of fear and confidence, for Aristotle, are determined not in relation to each other, but in relation to the likelihood of the occurrence of the previously noted pair of events. But the amount of a given contrary needed to produce the particular unity of which it is a part cannot be similarly fixed, since it is by definition an amount that will dampen the more extreme effects of its opposite. For example, Aristotle holds that the health of the human body depends on its being regulated by the proper blend of hot and cold. But in this case the right amount of cold can hardly be fixed independently of its opposite, since it must be able to temper the hot, thereby preventing its being excessive in a way that would destroy the body's health (*Phys* 246b3-6).

Finally, suppose for discussion's sake that these influences do somehow constitute a unity. Even so, we would be unable to determine the proper amount of each influence unless we already understood the specific function that the trait associated with such influences is intended to perform. This point may not have been evident to us in discussing the right amounts of feelings of confidence and fear, since we no doubt applied to that example our own intuitive grasp of some of the functions that courage enables us to perform. But if we deliberately exclude such information, then how much fear or confidence is appropriate? Since the right amount of feeling can be specified only in relation to the function that this feeling is intended to serve, the idea of such feeling seems to be merely a derivative of some yet-to-be-determined feature of an intermediate character state.

Should we therefore abandon the previous interpretation? Actually, it has been all but abandoned in recent writing on the doctrine of the mean.[5] Instead, a more popular contemporary view is that Aristotle

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4 D.J. Allan expresses a similar worry in *The Philosophy of Aristotle* (London: Oxford University Press 1952), 173. According to Allan, 'fear and confidence are not opposite points on a scale, so related that to exceed one is to fall short of the other (hot and cold), but … distinct emotions admitting of excess, moderation, and deficiency'. Also quoted in *Aristotle's Ethical Theory*, 145.

5 A notable exception is Clark, who adheres to a variation of the idea of virtue as a blend. See above n. 1.

holds that a state of character is intermediate because it aims at what is intermediate (*to meson*, *EN* 1106b27-8) in action and feeling, not because it unites the proper blend of contrary feelings.[6] Of course, our discussion of the previous difficulties helps us understand why its successor would adopt such an approach.[7] On the other hand, I believe it would be a mistake for us to reject entirely the idea that is central to the traditional interpretation: that of the unity of opposites. To be sure, the version of the idea on which this interpretation rests was shown to be flawed. Fortunately, however, there is a more promising version that also figures prominently in Aristotle's scientific writings: namely, that of homeostasis. Thus in the following discussion my objective is to show that this, rather than the earlier, version of the idea of the unity of opposites can shed light on Aristotle's doctrine of the mean.

Now, let us recall that the aim of the previous interpretation was to devise a view of the unity of opposites that would function as the practical counterpart of the theoretical version of the view. This counterpart, stated simply, was the unity of certain of our contrary motivational tendencies — e.g., fear and confidence. In the remaining discussion, however, it is the idea of homeostasis as actually employed in Aristotle's biological writings, rather than some additional practical surrogate, that is the basis for our interpretation of his doctrine of the mean. Such an idea, as we shall see, can do double duty in this manner because it signifies the principal regulating mechanism at work in both the nutritive and the cognitive-emotional aspects of our biological life.

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6 See Young, 'Aristotle on Justice', 234-5, 246, n. 3, who points to our need to distinguish between a state's being a mean (*mesotēs*) and its aiming at what is intermediate (*meson*). Young, of course, claims that we can only explain the first sense of the mean in terms of the second. Also cf. Urmson, 'Aristotle's Doctrine of the Mean', *Essays on Aristotle's Ethics*, 157-70, whose diametrically opposed view Young challenges.

7 It should not be assumed, however, that the alternative interpretation is necessarily immune from objection. For example, Sarah Broadie convincingly argues that, while the idea of intermediate character must be explained in terms of particular action, and not the other way around, there are two such ideas rather than a single one. The first, as proponents of the interpretation in question rightly maintain, explains intermediate character as that which aims at what is intermediate in action and feeling; the second, however, which these same proponents seem to ignore, makes the genesis of a desired character state the aim of one's action. See Sarah Broadie, *Ethics With Aristotle* (Oxford: Oxford University Press 1991), esp. 95-103.

III Emotion and Physiology

Aristotle's account of the emotions is often praised because it does justice to the cognitive, motivational, and behavioral aspects of the emotions. But it also deserves credit because it combines these various aspects in a broadly teleological approach that reveals their interdependence. According to this approach, emotions are specialized responses to different, relatively recurring demands imposed on us as beings who seek to flourish within a social environment, demands that arise from our need for protection, recognition, friendship, the fulfillment of appetite, and the like. Furthermore, these responses reveal our ability to adjust automatically the level and content of our activity to meet the changing demands of our surroundings. For example, we go from sorrow at a friend's misfortune, to anger at an offense, to pride in a particular accomplishment, to hope for the future, and so on, and we do so in a way that more or less manages to preserve the functional integrity of our emotional life in the process.[8] Of course, some people are more successful than others in responding to these different settings. For example, their hopes help sustain their efforts without also being manifestly at variance with the facts. Or although they make plain their anger to someone who has genuinely offended them, they characteristically do so without being unduly harsh or punitive. Such people, in other words, seem relatively successful in adjusting their responses to the varying demands of different social settings, i.e., successful in that they often, though of course not always, avoid the extremes of either underreaction or overreaction.

Now, I believe an attractive feature of Aristotle's physiology is the light it sheds on this self-regulating aspect of the emotions. His overall characterization of this physiology is teleological, not mechanistic: the parts of the body are arranged in order that the soul may achieve some measure of success in adjusting to its environment (*PA* 645b19-20). But because the latter's demands are constantly shifting, our physiological

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8 Such a sequence does not imply that we experience one strongly felt emotion after another; on the contrary, such responses are usually punctuated by periods of relative lack of feeling. Still, an important fact about us is the manner in which, through emotion, we adjust the level and content of our activity to match the changing demands of our situation. See also below, n. 13 for contemporary discussions of this important self-regulating aspect of emotional response.

nature must be able to meet these demands while also maintaining its overall integrity, which is what homeostasis accomplishes. To be sure, Aristotle's version of this notion is more primitive than the modern one, which, for example, relies on complicated feedback and feedforward mechanisms to explain how physiological responses can be self-regulating. Yet as we shall see, it is appropriate to ascribe to him some version of the notion of homeostasis because he appeals to the antagonism[9] of heart and brain to explain how, in a changing environment, our physiological states are maintained at relatively fixed levels.

Suppose, then, we consider further how this dynamic mechanism operates. Of the two organs,[10] the heart is clearly dominant, being both centrally located (*Juv* 467b25ff.) and the source of the internal heat on which our life as an organism depends (*Juv* 469b9-17, *Resp* 474a25-b3). Receiving nutrients already reduced by the work of the digestive organs, the heart, through its inherent warming activity, consolidates these in the form of blood (*PA* 647b4-7, 650a2-7), which it then pumps through the human vascular system, thereby allowing the blood's nourishment to reach even the most remote parts of the body. But the heart can successfully perform this complex task only if both it and the nutrients it transforms are tempered by the cooling activity of the brain:

> But as all influences require to be counterbalanced, so that they may be reduced to moderation and brought to the mean ... nature has contrived the brain as a counterpoise to the region of the heart with its contained heat, and has given it to animals to moderate the latter, combining in it the properties of earth and water.[11] (*PA* 652b16-23)

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9 The idea of such antagonism is, of course, an important feature of the more modern version as well. Consider, to cite a simple example, how glucagon and insulin, two hormones arranged in antagonistic opposition, regulate blood sugar levels. My concern here, however, is with Aristotle's version of the idea of homeostasis.

10 An excellent overview of the opposition of heart and brain is found in Tracy, *Physiological Theory*, IV. See also J.I. Beare, *Greek Theories of Elementary Cognition* (Oxford: 1906).

11 This and other translated passages are quoted from *The Complete Works of Aristotle: The Revised Oxford Translation*, ed., J. Barnes (Princeton: Princeton University Press 1984).

Actually, the heart in turn has a slight warming effect on the brain, since the latter, like any other organ, contains vessels so that it can receive the blood's nourishment. These vessels, however, are much narrower than those of other organs (*PA* 652b27-33), which is why the brain can both receive such nourishment and perform its important cooling activity. Thus each organ cancels out the other's more extreme effects, thereby producing a life-sustaining balance of hot and cold within the body. Yet this is no static balance, but a dynamic one that varies to accommodate not only changes in the system's external environment — e.g., seasonal or locational changes — but also the diverse needs of its internal one, i.e., of its various sub-systems. For example, Aristotle holds that the 'thicker and the hotter blood is, the more conducive it is to strength, while in proportion to its thinness and its coldness is its suitability for sensation and intelligence' (*PA* 648a2-4). The reason for this difference is that strength, i.e., vigorous action, depends on the blood's becoming warm enough so that its watery element is at least partly vaporized (*Juv* 479b31-2). For this process expands the heart in a way that enables its motion to be communicated to other bodily parts (*PA* 666b13-16). Yet this more turbulent state of the blood is ill suited for perception, which demands that blood be thin and calm to accurately receive impressions from the individual sense organs (*PA* 656b5-7).

This last claim, then, reveals the cogitive/emotional function that the body's balance of hot and cold also serves to regulate (*Juv* 469a16-20). For the heart, receiving sensory data carried by the blood (*Juv* 467b28-30, *PA* 667b28-31), organizes these data in a form that enables us to achieve a composite view of our surroundings, including one that, though the use of phantasms, allows us to represent the past and future and, more generally, that which is no longer before us (*Rhet* 1370a28-34). Then the heart and brain modify the body's balance of hot and cold in accordance with the particulars of this composite view. In fact, such variation is the basis of emotional response as Aristotle conceives it. As we have seen, Aristotle holds that warm, thick blood provides appropriate support for assertive activity, which is why he identifies emotions such as confidence and anger with different degrees of warmth. On the other hand, fear or timidity involves a cooling of the blood (*PA* 650b27-30), an effect which, while inhibiting such activity, was also shown to support accurate perception. In either case, though, emotion is conceived as an organized physiological response that enables its possessor to adjust somewhat successfully to the various types of social settings that characteristically evoke such a response

(*Phys* 246b3-7a4). For example, if I become frightened, then I anticipate[12] danger. But if I anticipate it, I can prepare[13] for it, in which case I am generally more likely to respond successfully to the threat I believe exists than had I been in a non-anticipatory state. Preparation also plays a role in anger, since the 'boiling of the blood' (*de An* 403a31), as we have seen, enables me to undertake the more vigorous protective action needed, say, to thwart my aggressor.

In so characterizing Aristotle's account of emotional response, it might be thought that I am being insensitive to the complex cognitive and evaluative properties of the emotions that Aristotle elsewhere, including especially within the moral domain, acknowledges. But I believe that it is a mistake to conceive these properties independently of Aristotle's understanding of the physiology of emotional response. Actually, Aristotle himself cautions us in this manner, when at the beginning of the *de Anima* he claims that emotion, unlike thought (*to noein*), cannot be a possible exception to the view that maintains the essential dependence of psychic states upon bodily ones (*de An* 403a3-8). He also reinforces this point, when in the same context he describes the emotions as 'enmattered essences'[14] (*logoi enuloi*, *de An* 403a25).

Yet although suggestive, *de Anima*'s brief treatment of emotion fails to explain sufficiently the nature and interconnection of emotion's material and formal components; this is why the present interpretation of Aristotle's physiology can help further its aims. For example, this interpretation insists on the essential material character of emotional response. Yet it is not reductionist because its explanation of physiological response is teleological, i.e., an explanation of how such organization enables its possessor to adjust to a degree to the particular demands of a given social setting. Similarly, it would be a mistake to think the present interpretation implies the rejection of emotion's

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12 See *Physics* 247aff., where Aristotle notes anticipating, along with remembering and acting, as fundamental activities linked with moral pleasures and pains.

13 For contemporary accounts of the preparatory conception of emotion, see: O.H. Mowrer, *Learning Theory and the Symbolic Processes* (New York: Wiley 1960); R. Plutchik, *Emotion: A Psychoevolutionary Synthesis* (New York: Harper and Row 1980); also Donald Ford, *Humans as Self-Constructing Living Systems* (Hillsdale, NJ: Lawrence Erlbaum Associates 1987), esp. 495-561.

14 Tracy also emphasizes this point. See *Physiological Theory*, 247-8.

complex cognitive character. Instead, it views the latter as a specific way in which our physiology has been organized. In fact, this last claim, as we shall see (Section V), allows us to appreciate the sense in which character modification is a matter of modifying our physiology — a point that contemporary philosophical accounts of the emotions seem to have overlooked.

On the other hand, the interpretation of emotion as a specialized physiological response is not meant to exaggerate the adequacy of such a response. For example, some of the events a person will be required to evaluate will be novel or, at any rate, will fail to fit comfortably within the evaluative classification scheme associated with a given type of emotional response.[15] In such cases, then, there is clearly adaptive value in our ability to refrain from responding in the unreflective, specialized manner afforded us by the emotions. Indeed, even in cases in which emotional response is wholly satisfactory, there is a need for further action of a sort that requires thoughtful deliberation. Thus, a military leader who feels the right amount of confidence and fear may also need to devise a plan capable of achieving his intended objective[16] — indeed he may even need to revise it in the midst of battle.

Similar qualifications also apply in connection with an individual's life-plan, since there are relatively enduring features of his physiology that generally dispose him to one form or another of excessive or deficient response. For example, Aristotle holds that individuals who have smaller hearts or narrower vessels are likely to have a confident nature, whereas those whose hearts are larger or whose vessels are wider are apt to be cautious or fearful (*PA* 667a19-27). Aristotle defends this conclusion by observing that the degree of warmth of these regions is partly a function of their volume, in which case the greater the volume, the cooler the region:

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15 Martha Nussbaum notes the importance of such events in her criticism of rule-governed conceptions of rationality. See 'The Discernment of Perception', in John J. Cleary, ed., *Proceedings of the Boston Area Colloquium in Ancient Philosophy* Vol. I (Lanham: University Press of America 1986), esp. 177-8.

16 Richard Sorabji rightly emphasizes this point in response to interpreters of Aristotle's account of virtue who exaggerate the importance of emotion and habit. See 'Aristotle on the Role of Intellect in Virtue', in *Essays on Aristotle's Ethics*, 201-19.

> What has been said of the heart as a whole is no less true of its cavities and of the blood-vessels; these also if of large size being cold. For just as a fire of equal size gives less heat if in a large room than in a small one, so also does the heat in the present for the vessels and cavities are receptacles. (*PA* 667a22-7)

These structural differences, therefore, produce differences in the physiology of emotion, which in turn shape some of the characteristic ways in which an individual is likely to be at an advantage or disadvantage in trying to achieve the mean. If ethics either ignores these differences or is insensitive to the depth of their influence on us, it can only offer prescriptions that are uselessly general or, worse, wholly ill suited for a person given his or her characteristic physiology. For this reason, ethics must be constrained by at least a general knowledge of these as well as other relevant physiological matters.

IV The Modification of Our Physiology

This last point hints at a further way in which Aristotle's physiology contributes to his doctrine of the mean. As we have seen, the perfection of our emotional life requires us to emend one-sidedness in our individual character. To accomplish this aim, Aristotle advises us to 'drag ourselves away to the contrary extreme; for we shall get into the intermediate by drawing well away from error, as people do in straightening sticks that are bent' (*EN* 1109b4-7).

Why should we think that in being guided by this recommendation we will achieve such results? More specifically, why think that to achieve the mean we should aim at that extreme *most opposed* to the one to which we, as individuals, are attracted? Unfortunately, Aristotle's ethics contains no answer to this question. Of course, the previous passage reveals that he at least gives an analogical response to the previous question: i.e., bad habits, like bent wood, can be 'straightened' by having their possessor aim at developing a contrary habit. But what literal state of affairs within Aristotle's framework does the analogy purport to represent?

I believe that further inspection of the previous physiological account can provide us with at least the outline of an answer. First, recall that, for Aristotle, heart and brain together maintain a balance of hot and cold that regulates emotion and cognition no less than the soul's peculiarly nutritive functions. Second, this balance will vary from one individual to the next. More specifically, it will be warmer in those who are confi-

dent, cooler in those who are cautious. Thus, using these claims to restate Aristotle's advice, we obtain the following: those whose systems run slightly warmer can cool them to a degree (i.e., can achieve the mean) by emulating those who are cautious, say, be deferring action until they have calmly considered the facts relevant to a given decision. And, similarly, the cautious can warm their systems slightly if, for example, they do not unduly delay action when they are in an enlivened state. In other words, a person of a given character type can modify his physiology in the appropriate manner by emulating the character type most opposed to his own.

Can this restatement of Aristotle's advice enable us to begin to understand the rationale that underlies the latter? According to Aristotle, whenever an element or a stable blend of such elements is subject to a sufficient degree to the influence of its contrary, its nature will change in the direction of that contrary.[17] If the latter's influence is exceedingly great, the substance will lose altogether its nature, as, for example, Aristotle thinks happens when a drop of wine is placed in a container of ten thousand gallons of water (*GC* 328a26-8). If, however, the difference in question is considerably less, the former substance will change *to a degree* in the direction of the latter:

> Now since there are differences of degree in hot and cold, then although when either is actual without qualification, the other will exist potentially; yet, when neither exists in the full completeness of its being, but both by combining destroy one another's excesses so that there exist instead a hot which (for a hot) is cold and cold which (for a cold) is hot; then there will exist neither their matter nor either of their contraries in actuality without qualification, but rather an intermediate ... (*GC* 334b8-13)

It might be thought that this type of qualified change — namely, change toward an intermediate — is at best merely analogous to the type that pertains to a person's ability to modify the balance of hot and cold that regulates his emotional life. For whereas the latter, as we have here

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17 In his *Physiological Theory*, 163-74, Tracy gives a brief summary of Aristotle's account of chemical combination. But he does not attempt to apply this account to Aristotle's ethics in the manner I outline in this discussion. Instead, Tracy's own view of Aristotle's ethics takes the mean to involve a blending of the 'opposing powers' of pleasure and pain (296).

understood it, is a matter of physiology, the former concerns the chemistry of change, as Aristotle conceives it. But, in a strict sense, even the former kind of change is chemical in that the idea of the balance of hot and cold is that of the basic chemistry that regulates our physiological processes. For example, it is the brain's chemical composition, its being made of so much earth and water, that enables it to function as the agent that tempers the heart's internal heat. The conclusion, then, suggested by combining the previous physiological restatement of character modification with the principle of qualified chemical change is as follows: character change in the direction of one's opposite can succeed because it eventually changes the chemistry that regulates the physiology of emotion. Indeed, it is the alteration of this chemical regulating mechanism that gives us reason to think that the physiological change can be an enduring one.

We can put this last point slightly differently. Although we need to be able to disrupt an undesirable state — something that aiming at the extreme farthest from us would seem to achieve — we also need to be able to bring about a relatively stable successor, including one that represents an intermediate state relative to us. Because the previous principle of qualified change applies to the chemical balance that regulates our emotional life, it gives us some assurance that the desired physiological change can be stable and relatively enduring. And because it is a principle that pertains to qualified, i.e., intermediate change, it can also assure us that such change will be of a kind likely to move us in the direction of the mean.

V The Philosophical Significance of Aristotle's Doctrine

I have outlined an interpretation of Aristotle's doctrine of the mean that relies more heavily on his physiology than do most contemporary interpretations. In fact, Aristotle himself says rather little about this discipline in his ethical writings. He also tells us that ethics need state only roughly and in outline the relevant features of the non-ethical, i.e., scientific, disciplines to which it is connected (*EN* 1094b11-27, 1098a20-33, 1102a23-32). Why, then, think that the previous examination of Aristotle's physiology has successfully shown that it is more than incidentally related to his ethics, particularly to his doctrine of the mean?

His ethics and physiology are closely related, we have seen, because the very subject-matter of his doctrine of the mean, namely, the emotions, is physiological in nature. Furthermore, this physiology is teleological in

that the coordinated physiological response that defines a particular emotion enables its possessor to adjust to a degree to the requirements of a given social setting. Finally, since each person's physiology differs somewhat from that of others, the idea of an emotion's being in an ideal state, i.e., its being sensitive to both the requirements of its associated setting and to the requirements of other emotional states, varies from one person to the next. For these reasons, the normative study of the emotions must be framed in light of a knowledge of physiology (among other disciplines); otherwise the recommendations that the study generates will be vague and unhelpful, since they will be insensitive to important differences in our emotional lives.

Aristotle can also claim that an emotion's being physiological does nothing to undermine the normative status of such recommendations. On the contrary, his account of the basic chemistry of our physiological processes seems congenial to the view that we can influence our physiology by influencing the chemical mechanism, i.e., the balance of hot and cold, that regulates our physiological processes. After all, our aim in emending and enhancing our emotions is to produce stable habits of feeling that bring us closer to the mean as it applies to us as individuals. But Aristotle can account for such stability by claiming that the balance of hot and cold that defines homeostasis is, like other chemical processes, subject to what I have referred to as his principle of qualified change.

So conceived, I believe that Aristotle's doctrine of the mean can still be of interest to us. In fact, there appear to be three specific ways in which the present interpretation of his doctrine can help remedy important deficiencies in contemporary discussions of character ethics. First, his doctrine reminds us that the task of modifying emotion *is* properly one of modifying individual physiology. Indeed, it is instructive to offer this reminder to the person whose anger is characteristically excessive, just as it is to offer it to the person whose anger is deficient, or to the person who has too much or too little fear, and so on. Unfortunately, this point is usually ignored by contemporary virtue ethicists, whose philosophical accounts of emotion, unlike Aristotle's account, emphasize the cognitive at the expense of the physiological.[18]

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18 If the physiology in question is, say, mechanistic, then such a response does seem convincing. But that is just the problem, namely, the failure of contemporary philosophical accounts of emotion to envision a physiological framework that is amenable to its philosophical aims.

Second, although Aristotle wrongly identified the central controlling mechanism of our physiological nature, he was right to insist both that there is one[19] and that to modify our individual physiology in an enduring way is to modify the chemistry that regulates this physiology. According to our contemporary perspective, the corrected version of this approach consists in determining the extent to which an individual can influence her own brain chemistry in order to provide biological support for her fledgling habits.

Finally, our discussion of Aristotle's doctrine suggests that virtue ethicists have paid insufficient attention to the ways in which their discipline must take into account the results of the previously noted non-philosophical disciplines, including psychology,[20] physiology, and biochemistry. For, as we have seen, a principal normative task of virtue ethics is to prescribe those traits that enhance our ability to flourish as individuals who have different psychophysiological natures. But it is unlikely that virtue ethics can fulfill this normative task by continuing to produce a merely philosophical psychology.[21]

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19 See my 'Human Flourishings: A Psychological Critique of Virtue Ethics', *American Philosophical Quarterly* 31 (1994) 333-42. There I argue that virtue ethics's philosophical psychology seems unable to contribute to this sort of self-understanding.

20 This point is effectively made by Charles H. Kahn in 'Sensation and Consciousness in Aristotle's Psychology', in J. Barnes, M. Schofield, and R. Sorabji, eds., *Articles on Aristotle* 4.

21 I am grateful to Melissa Martin, the graduate students of my Virtue Ethics Seminar (Spring 1995), and to Janet Sisson for their constructive suggestions and criticisms.