GALEN AND THE HUMOUR THEORY OF TEMPERAMENT

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Summary—This paper relates how Galen of Pergamum (AD 130–200) used the theory of humours to explain individual differences in character. The four primary humours, chole (bile), melanchole (black bile), sanguis (blood) and flegma (phlegm), were understood in terms of a general cosmological theory in which fire, earth, air and water were the four basic elements of all things. Physical constitution and psychological characteristics were determined by the balance or blend (L. temperare) of the humours. In general, Galen made few characterological observations and these adjectives showed a negligible correspondence to the adjectives that were later ascribed to the four temperament categories. The legacy of Galen’s theory of humours, however, is a descriptive typology of character that emerged in the eighteenth and nineteenth centuries and that bears a remarkable resemblance to the extraversion and neuroticism dimensions.

It would be better, I believe, for a person who indeed searches for the truth not to consider the words of the poets but to prefer scientific assumptions.—Galen.

INTRODUCTION

Temperament traits can be defined as constitutionally determined dispositional characteristics that influence the manner in which a person’s actions are expressed. A good deal of current interest in temperament traits follows from compelling evidence that extraversion and neuroticism, in Eysenck’s typology, can be regarded as fundamental traits (Eysenck & Eysenck, 1985). These traits have high heritability (Loehlin, 1989) and there is good progress in establishing the biological bases of these dimensions (Stelmack, 1990). An intriguing notion has it that these temperament traits can be traced back to the system of four temperaments that is described in the works of the Greek physician Galen during the second century (Eysenck & Eysenck, 1985). The purpose of the present paper was to examine the ancient theory of humours, to relate how Galen used this theory to explain differences in character, and to consider the characteristics that he ascribed to the four temperament types, in particular as they refer to the traits in the four quadrants defined by the axes of the extraversion and neuroticism dimensions.

The relationship between the modern extraversion–neuroticism typology and the four humours that descended from Hippocrates to Galen and through to the present was illustrated by Eysenck (1964) and is reproduced in Fig. 1. After Galen, a typology of the four humours was developed and sustained by scholars of some renown such as William of Conches, Immanuel Kant and Wilhelm Wundt. Following in the tradition of those scholars, Eysenck (1964) selected adjectives from the results of a large number of factor analytic studies of ratings and ascribed them to the four humours in Fig. 1. The stable introvert can be considered as a phlegmatic type that is passive, careful, thoughtful, peaceful, controlled, reliable, even-tempered and calm. The neurotic introvert can be regarded as the melancholic type that is characterized as moody, anxious, rigid, sober, pessimistic, reserved, unsociable and quiet. Stable extraversion is referred to the sanguine type that is characterized as sociable, outgoing, talkative, responsive, easy-going, lively, carefree and showing leadership. Unstable extravers resemble the choleric type that is described as touchy, restless, aggressive, excitable, changeable, impulsive, optimistic and active. Although placement of the adjectives in the four quadrants was not accomplished with empirical procedures (Eysenck, 1964), the efficacy of the classification recently received some endorsement from empirical work on mood states. Predictions of extraversion and neuroticism that were made on the basis of these descriptions of the four temperament types were indeed confirmed (Howarth, 1988; Howarth & Zumbo, 1989).
Fig. 1. Relation between the four temperaments and the modern neuroticism–extraversion dimensional system. (From H. J. Eysenck and M. W. Eysenck, *Personality and individual differences*, Copyright 1985 by Plenum Press, adapted by permission.)

Given this remarkable link to antiquity, we were led to the question of how the ancient theory of humours accounted for the different temperament characterizations. There are a number of excellent treatises on Galen’s writings that were helpful in initiating the inquiry. A translation of *On the natural faculties* that appears in the *Great books of the western world series* (1952) provided a good introduction to his views. A comprehensive analysis of Galen’s work was written by Siegel (1973) using Kuehn’s translation of original Greek texts. Concise and illuminating treatments by Smith (1930), Reeves (1958) and Phillips (1973) were also consulted. In general, however, these works describe Galen’s understanding and treatment of medical problems and issues. Personality characteristics were only given cursory attention. The treatise *On temperaments* was frequently referred to and from the title would seem relevant to an understanding of temperament, and it was. An English translation of this text was not extant, but a text (Galen, 1938) in ancient Greek and old-modern Greek (katharevousa) was obtained from the University of Thessaloniki and translated by Stalikas. Another useful source was the book *Saturn and melancholy*, which was an exceptional, scholarly treatment of this subject that influenced the views expressed in this paper considerably (Klibansky, Saxl & Panoftsky, 1964).

**THE THEORY OF HUMOURS**

The classical theory of humours was first put forth by Hippocrates (ca 460 BC) in his treatise *Of the nature of man* (1978). For the most part, the approach was endorsed by Galen. In general, Hippocrates developed a schema that presented the humoral pathology of traditional medicine in the context of general cosmological speculations that are represented most clearly in the views of Empedocles (ca 440 BC) and his successors. Several ideas in the theory of humours have their origin in earlier Greek philosophy and it is illuminating to consider some of them. The origins of the theory can be traced to four sources that preceded Hippocrates: (1) a medical tradition that regarded the humours as a cause of illness, (2) principles of Pythagorean philosophy concerning harmony, balance and tetrads, (3) Empedocles’ theory of primary elements of the universe, (4) the doctrine of qualities that evolved when the theory of elements was applied to mankind.
In the view developed by Hippocrates, the humours assumed an importance quite beyond the clinical manifestations described by his predecessors and the fourfold classification was also significant.

Definition of humours

The humours were considered to be causes of illness in a long medical tradition that preceded Hippocrates (Smith, 1930). Four of the humours that were distinguished were phlegm, black bile, yellow bile and blood. There were other humours as well but these four came to be regarded as primary. In Greek medicine, it was understood that food digested in the body was transformed into blood, bones and muscle. It was conceived that the humours developed from material that was indigestible or surplus. Although blood did not fit as a surplus humour, its importance was recognized and it was regarded as a primary humour. Excesses or deficiencies in the humours caused illness. If the humours became visible as in vomiting or in the expectoration of mucus through coughing, they served as symptoms of illness. In the ancient humoural pathology, for example, yellow bile (Gr. cole = bile) was identified by the presence of that colour in excrement or vomit. Excess of this humour was thought to cause jaundice and other straw-coloured inflammations of the skin. Black bile (Gr. melas = black + Gr. cole = bile) was detected in the blood as a heavy sediment or by skin colorations and was associated with dysentery, cholera and intestinal disorders. Respiratory diseases such as pneumonia and pleurisy were attributed to phlegm (Gr. flegma = mucus). The fourth humour, blood (L. sanguis = blood), caused anaemia when deficient. What Hippocrates endeavoured in his treatise was to incorporate such traditional humoural pathology as this with the context of the general theory of elements that was espoused by Empedocles. The theory incorporated several basic ideas that were attributed to Pythagorean scholars (from the sixth century BC).

Pythagorean tetrads and the cosmology of Empedocles

The Pythagoreans were devoted to the study of mathematics and they were amongst the first to advance that discipline. They were enthralled by the pervasive significance of numerical expression in the world. For example, they discovered that notes on the lyre could be understood in regular numerical relationships. Pitch depended on the length of the strings and the intervals on the scale could be expressed as ratios. There were compelling numerical illustrations of astral, planetary, and lunar periodicity. Just as musical harmony depended on number, they reasoned that the harmony of the universe also depended on number. In their numerology, the number four was of special (even sacred) significance; every material body was an expression of the number four. Apparently, the Pythagoreans regarded numbers spatially. One is the point, two is the line, three is the surface and four is the solid. Thus, the number four was identified with the material universe (Copestoke, 1946). The logical consistency of their study and the impressive demonstrations that they made, such as the renowned Pythagorean theorem, earned widespread and longstanding acceptance of many of their principles.

The cosmology of Empedocles incorporated several tetradic categories that had been discussed by the Pythagoreans, notably the four elements; air, fire, earth and water, and the four seasons; spring, summer, autumn and winter. Indeed, there was some discussion on whether Empedocles was expelled from the order of Pythagoreans for “stealing discourses”. In any case, Empedocles is credited with a Doctrine of the Four Elements which paired the “four roots of the All” with four cosmic entities the sky, the sun, the earth and the sea. Further, it was Empedocles who firmly established the view that all matter, human beings as well as the physical universe, was composed only of earth, water, air and fire, a classification that identifies the general forms of matter—solids, liquids and gasses—and energy. These elements, which could account for both macrocosmic and microcosmic matter, were fundamental and eternal in that they were unchangeable, ultimate and indestructible elements. The successors to Empedocles’ views sought out specific substances and functions in man that were consistent with the four primary elements without being merely identical to them.

In extending the theory of elements to understand the composition of man, the primary elements, which were of an entirely material nature, were ascribed qualities that afforded them a dynamic character. These qualities established a link between the primary elements and corresponding
substances of the human body that, empirically, could not be directly considered in terms of air, earth, water and fire. The quality attributed to air was cold; to fire, heat; to water, moist; and to earth, dry. By introducing ideas of quantity (too much or too little) and density (too fine or too coarse) a wide range of differentiations could be made. The formation of dual combinations of qualities (warm and moist; warm and dry; cold and moist; cold and dry) further distanced the qualities from the primary elements. The qualities themselves came to serve as the predicates of any other substances. These notions guided the theory of humours that was written in the treatise *Of the nature of man* that is attributed to Hippocrates (1978).

**Hippocrates and the theory of humours**

The tetrads venerated by the Pythagoreans and Empedocles were maintained in the schema that Hippocrates evolved. The four seasons of the year and the four ages of man (childhood, youth, prime and old age) were both prominent in his system. The doctrine of qualities forged the link between Empedocles' primary elements of matter, the four humours, the four seasons and the four ages of man. It was conceived that the humours were manifestations of the four primary elements, or more specifically, the qualities of the elements. The humours varied in their ascendency according to the four seasons of the year and the four stages of life and they varied in their natural endowment among individuals. In this way, the four humours, and the manner in which they combined, determined an individual's illness or health, the course of life, behaviour and character. Blood was a manifestation of air, having the qualities warm and moist, and predominant in childhood and during the springtime. Yellow bile was a manifestation of fire, having the qualities warm and dry, and predominant in youth and during the summertime. Black bile was a manifestation of earth, having the qualities cold and dry, and predominant in prime of life and during the autumn. Phlegm was a manifestation of water, having the qualities cold and moist, and predominant in old age and during the winter season. The relationship between the four elements, the four qualities and the four humours is illustrated in Fig. 2.

**Galen on the natural faculties**

In his most famous treatise, *On the natural faculties*, Galen (1952) described and, in the main, endorsed the understanding of the humoral composition of man and of the genesis of the humours that was developed by Hippocrates and other ancient writers. He averred that our bodies were "compounded out of the Warm, the Cold, the Dry and the Moist" and "that among these the warm is the most active, and those animals which are by nature warmest have abundance of blood, whilst those that are colder are entirely lacking in blood, and consequently in winter lie idle and motionless, lurking in holes like corpses". On the genesis of the humours, he endorsed the following view:

> When the nutriment becomes altered in the veins by the innate heat, blood is produced when it is in moderation, and the other humours when it is not in proper proportion.

![Fig. 2. The relation between the four cosmic elements, the four qualities of the elements and the four humours.](image-url)
And all the observed facts agree with this argument. Thus, those articles of food, which are by nature warmer are more productive of bile, while those which are colder produce more phlegm. Similarly of the periods of life, those which are naturally warmer tend more to bile, and the colder more to phlegm. Of occupations also, localities and seasons, and above all, of natures themselves, the colder are more phlegmatic, and the warmer are more bilious. Also cold diseases result from phlegm, and warmer ones from yellow bile. There is not a single thing to be found which does not bear witness to this account.—Also the diseases which are primary and most generic are four in number, and differ from each other in warmth, cold, dryness, and moisture (Galen, 1952, p. 193).

The definition and diagnosis of temperament

In the treatise On the natural faculties, Galen argued that the four qualities were combined in the four humours. The most direct example considered the phlegm where he stated: “Thus, the white-coloured substance which everyone else calls phlegm, and which Prodicas calls blenia (mucus), is the well-known cold, moist humour which collects mostly in old people and in those who have been chilled in some way, and not even a lunatic could say that this was anything than cold and moist” (Galen, 1952, p. 196). The identification of the other humours with combinations of the qualities proceeded in a somewhat more convoluted fashion that echoed the inferences and analogies of his predecessors. In the text, it is clear that the term temperament (L. temperare = to combine or blend in proper proportion) refers directly to the specific qualities the warm, cold, dry and moist, the four causes by which everything throughout nature was determined. The “combination of temperaments, which exist in all other things” also exists in the humours. In this sense, temperament was defined, literally, in terms of the mixture of heat (warm and cold) and moisture (moist and dry) that were characteristic of the humours. In the treatise On temperaments, Galen (1938, p. 86) described an optimal temperament in which all four qualities were in balance (Gr. eucrasia = best mixture possible) without any quality being in excess.

The best temperate man is he who in the body seems to be in the mean of all extremities, that is skinniness and fatness, heat and coldness... and regarding the body this is the best temperate man. Similarly in his soul he is in the midst of boldness and timidity, of negligence and impertinence, of compassion and envy.

He is cheerful, affectionate, charitable and prudent.

This ideal temperament was characterized by a perfect symmetry in all physical and psychological characteristics. Four temperaments were diagnosed when one of the four qualities was in excess. Galen also held that there were two axes on which complimentary qualities varied; the cold-hot and the moist-dry. When two axes were out of balance it was possible to have two elements that were in excess, that is four double combinations. In this schema, then, nine temperaments (including the optimal) were identified and they were not categorically independent.

In diagnosing temperament, it was necessary to know the mean of each axis in order to determine when the quality was in excess. This was done by physical examination and inspection. Further, Galen argued, the mixture of the four qualities in the body could be best assessed by examining the skin. By nature, the skin gave the best evidence of a balanced mixture of the four qualities. For example, everything harder than the skin (like the bones, nails, corns, hair) tended to be dry while everything softer than the skin (blood, phlegm, fat, brain) tended to be moist (Galen, 1938, p. 74). In this discussion, he pointed out that the best site for assessing the blend of the four humours from the skin was the palm of the hand. Galen concluded that the palm has a relatively balanced amount of the warm, cold, dry and moist. From this perspective, the palm was the best predictor of human temperament. Needless to say, we have uncovered here the roots of mediaeval and modern palmistry and of contemporary electrodermal psychophysiology.

Perhaps more than his predecessors, Galen emphasized the links between the primary qualities, the humours and character. Observations of character appear in several commentaries on the combination of qualities. It is clear, however, that the four adjectives sanguine, choleric, melancholic and phlegmatic, which are the four humours, were not uniquely employed to describe
character. These humours were foremost the determinants of illness, constitution and physiognomy. In regards to the latter, "heat made a man tall, cold short, moisture fat, and dryness thin... the soft, fair and fat possessed the least melancholy humour, the thin, dark, hirsute and prominently veined the most" (Klibansky et al., 1964, from De locis affectis). Evidently, black bile was the first humour to which differences in character were attributed. Galen followed a long tradition in linking symptoms of anxiety and depression to black bile. In the treatise Opera omnia, he described the character of the melancholic temperament as follows:

The melancholics act differently: they show fear and depression, discontent with life and hatred of all people. On the other side, the desire to die is not common to all, although fear of death is the principal concern of some. A few people are bizarre, since they dread and desire death at the same time... As external darkness renders almost all people fearful with the exception of a very few naturally audacious persons or those who were taught in this manner, thus the color of the black humour obscuring the area of thought brings about the fear... all people call this affliction now melancholism, indicating by this term that the black humour is etiologically responsible (from Siegel, 1973, p. 195).

In general, Galen's references to character were fragmentary. However, a succinct statement of his views on character was expressed in his commentary On the nature of man as follows:

There is also another theory... according to which the four humours are shown to contribute to the formation of moral characteristics and aptitudes. But one would have to start by demonstrating first that the mental characteristics depend on the bodily constitution. About this we have written elsewhere. Assuming it, therefore, as proved, it follows that acuteness and intelligence of the mind come from the bilious humours, steadiness and solidity from the atabilious (black bile), but from the blood simplicity bordering on foolishness. But phlegm by its nature does not contribute to the formation of character, as it evidently is always a by-product at the first stage of the metabolic process (from Klibansky et al., 1964, p. 58).

Since phlegm did not influence character, the system of character classification was incomplete. It is also evident that Galen's characterological observations were quite limited. Furthermore, these observations bear only a scant resemblance to later descriptive adjectives ascribed to the temperament types. However, the simple structure of the theory, and the rich interconnections between all levels of life that derived from its power to explain everything, enabled subsequent authors to elaborate, to embellish and to eventually define the schema authoritatively.

The legacy of Galen: Culpeper, Kant and Wundt

The basic principles of Galen's work were faithfully reproduced well into the seventeenth century. A collated translation and commentary by Nicholas Culpeper, a gentleman student in 'physick and astrologie', presented this view of Galen's theory to English readers in 1652:

An Element is a Body pure, simple, unmixed, from which all Natural things have their Original, They are held to be in number four, Fire, Air, Water, Earth; their Operations are Active as heat and cold, and passive as dryness and moisture. Complexions are the Operations of these Elements upon Mans body, as when the Fire prevails, the body is Chollerick, when the Air he is Sanguine, when the Water he is Flegmatic, when the Earth he is Melancholly.

Culpeper gives a comprehensive picture of the medical and physiognomic attributes of each humour. In addition, he presents, on his own terms rather than in translation, character descriptions for each of the complexions (temperaments) as well as of each combination of all possible pairs. At this time, a full, rich vocabulary described the temperament categories.

During the eighteenth century, temperament was a topic of discourse in the natural philosophy of Immanuel Kant. In the text, Anthropology from a pragmatic point of view, Kant (1974) made a clear distinction between the physiological and psychological meanings of temperament, a distinction that assumed the corporeal and spiritual nature of man. From the physiological point
of view, temperament referred to physical constitution (delicate and strong) and complexion, including fluid elements, vital forces and humours within the body. This meaning of temperament was consistent with the ancient humoural theory. From the psychological point of view, temperament referred to the emotional and appetitive capacities of the soul. This psychological meaning of temperament had a subjective component, feelings, and an objective component, activities or manifest inclinations. The physiological and psychological meanings of temperament were conceived as terms that were psychophysically parallel; a causal relation between the two terms was possible but not necessary.

In emphasizing a psychological meaning of temperament, Kant made a clear transition from a causal, explanatory construct, as employed by Galen, to a descriptive construct, as employed in contemporary psychometric typologies (Eysenck & Eysenck, 1964). He expressed this view in the following way:

—(temperament) terms referring to the composition of the blood do not serve to indicate the cause of what happens when a man’s sensibility is affected, whether according to the pathology of the humours or of the nerves: they only serve to classify these phenomena by the effects we observe. For in order correctly to assign a man the title of a particular class we do not need to know beforehand what chemical composition of the blood entitles us to name a certain characteristic property of temperament; we need to know, rather, what feelings and inclinations we have observed in him (Kant, 1974, p. 152).

Kant divided the temperaments into temperaments of feeling and temperaments of activity. Each of these was further subdivided according to “a heightening (intensio) or slackening (remissio) of the vital force”. In this schema, he classified the sanguine and melancholy temperaments as contrasting, bipolar temperaments of feeling, with the former characterized by strong and short-lasting feelings and the latter by weak and longer lasting feelings. The choleric temperament was described as a temperament of intense, but not persistent activity. In contrast, the phlegmatic temperament was cast as inactive, but enduring. Although only two terms, feeling and activity, were used to distinguish the temperaments, Kant emphasized that there were no combinations. There were four temperaments in all and each of them was independent. This insistence followed a logical analysis. The division of the two classes of temperaments, feeling and activity, each connected by intensity, yielded only four simple temperaments.

A similar psychological approach was expressed by Wundt (1886) in his text Elements of physiological psychology. In his view, however, the classification of temperaments was based on two concepts, strength of emotions and changeability, rather than feelings and activity as Kant believed.

The choleric and melancholic are inclined to strong emotions; the sanguine and phlegmatic to weak emotions. The sanguine and choleric are disposed to rapid change; the melancholic and phlegmatic to slow change (Wundt, 1886, p. 391).

Wundt (1886) is credited with shifting the emphasis of the typology of his predecessors from four independent categories to a two-dimensional system. In this way, an individual was described in reference to two dimensions that encompassed the four types, strong–weak emotions and changeable–unchangeable activity and that clearly resemble the neuroticism and extraversion dimensions respectively.

There are obvious similarities between the schemas of Kant and Wundt in the correspondence of feelings to emotions and of activity to changeability. But an important difference involved what can best be described as a rotation of the axes, yielding a contrast in perspective that is echoed, in a way, by contemporary views of extraversion and neuroticism that have been advocated by Eysenck and Gray (cf. Eysenck, 1981). The differences in the perspectives of Kant and Wundt are schematically illustrated in Fig. 3. It can be seen that in Kant’s schema, two of the temperament types were referred to one concept, feeling, and two of the temperament types were independently referred to another concept, activity. In Wundt’s schema, each of the four temperament types was referred to two concepts, one distinguished by speed of change, the other by degree of strength of emotion.
CONCLUSIONS

In antiquity, humours were bodily fluids that influenced the health, physiognomy, and character of man. The four primary humours, chole (bile), melanchole (black bile), sanguis (blood) and flegma (phlegm), were understood in terms of a general cosmological theory in which fire, earth, air and water were the four basic elements of all things. The humours possessed the qualities of heat, coldness, dryness and wetness manifested by the four elements. Temperament referred specifically to the blending of the four manifest qualities of the humours. For Galen, psychological characteristics were expressions of bodily processes and as such they were influenced by the particular blend or balance of the four humours. In general, Galen’s characterological observations were fragmentary and their congruity to adjectives that were later ascribed to the temperament categories was limited. One can conclude that Galen’s characterologic descriptive system was rather undeveloped or Spartan. Indeed, one can hardly claim that Galen subscribed to a typology of character. As medical science progressed, humoral pathology was abandoned and the validity of the association of personal characteristics to the humours also diminished. None the less, the longevity of Galen’s humoral theory is testimony to an elegant theoretical structure, reasonable empirical evidence and the absence of compelling alternatives.

The four temperament categories continued to flourish as descriptive psychological systems in the influential works of Kant and Wundt during the eighteenth and nineteenth centuries. Both of these authors presented dimensional schemata that incorporated the four classical categories. Neither author ventured to develop a causal basis or theory of the temperament types to replace Galen’s humoral theory. This is a twentieth century initiative of Eysenck (1967).
And what of the remarkable congruity of the modern extraversion-neuroticism typology to the ancient humoural theory of temperament? With respect to Galen's work, there seems to be little in the manner of significant descriptive connections and the demise of humoural theory obviates any substantive basis for causal connections. About half, or somewhat less than half, of the adjectives Kant employs in his description of the temperament types appear in Eysenck's (1964) list. However, at the second order of analysis, taking account of the dimensions of feeling and activity offered by Kant and the dimensions of strength of emotions and changeability offered by Wundt, the congruity with neuroticism (emotionality) and extraversion (social activity) is uncanny. It would appear that Kant, in particular, was an astute observer of character who compiled, with the aid of scholars who preceded him, a comprehensive list of personality descriptors. Through mastery of the language and meaning of those descriptors, he assembled those terms into general categories that are congruent with the fundamental language concepts of personality that have been revealed to us by methods of factor analysis.

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