THE PSYCHOLOGICAL REVIEW.

THE THEORY OF EMOTION.

(I.) EMOTIONAL ATTITUDES.

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In the following pages I propose, assuming Darwin's principles as to the explanation of emotional attitudes, and the James-Lange theory of the nature of emotion, to bring these two into some organic connection with each other, indicating the modifications of statement demanded by such connection. This close dependence upon results already reached, together with the impossibility of an adequate discussion of all details in the given limits (to say nothing of the immediate availability of most of the details in every one's experience), must be my justification for the generic, and even schematic, quality of the discussion. This may be regarded either as a sketch-map of a field previously surveyed, or as a possible outline for future filling in, not as a proved and finished account.

The necessity of bringing the two theories together may be seen from the fact that the very phrase 'expression of emotion,' as well as Darwin's method of stating the matter, begs the question of the relation of emotion to organic peripheral action, in that it assumes the former as prior and the latter as secondary.

1. Now this assumption, upon the basis of the discharge theory (as I shall call the James-Lange theory), is false. If one accept the latter theory, it is incumbent upon him to find the proper method of restating Darwin's principles, since there is no doubt of their substantial significance, however erroneous

may be their underlying assumption as to the relation of emotion and peripheral disturbance.*

Professor James himself does not seem to me to have adequately realized the inconsistency of Darwin's principles, as the latter states them, with his own theory; or the needed re-statement would already have been performed by a much more competent hand than my own. At least he quotes, with apparent approval, explanations from Darwin which assume the priority of an emotion of distress to the contraction of the brows; and even suggests that Darwin does not go far enough in recognizing the principle of reacting similarly to analogous feeling stimuli.† Surely if James's conception of the origin of emotion is true, the statement that we react similarly to stimuli which feel alike must be translated into the statement that activities which involve, in like fashion, the same peripheral structures feel alike.‡

2. One does not, however, need to be committed to James's theory to feel the need of a different way of stating the particular undoubted facts discovered by Darwin. Physiologists

* While Darwin's language is that of the dependence of 'expression' upon emotion, it is interesting to note that so careful an observer has, in one place, anticipated and definitely stated the discharge theory, *Expression of Emotions*, p. 239. (My references are to the American edition.) "Most of our emotions are so closely connected with their expression that they hardly exist if the body remains passive—the nature of the expression depending in chief part on the nature of the actions which have been habitually performed under this particular state of mind." (Note in this latter phrase the assumption of the priority of emotion; but the continuation is unambiguous in the other sense.) "A man, for instance, may know that his life is in extremest peril, and may strongly desire to save it; yet as Louis XVI. said when surrounded by a fierce mob, "Am I afraid? Feel my pulse." So a man may intensely hate another, *but until his bodily frame is affected he cannot be said to be enraged.*" (Italics mine.)

† *Psychology*, vol. II., pp. 480-81. The exactness of the latter statement may be doubted, as Darwin recognizes the facts, but includes them under the principle of serviceable associated habits (*Expression*, 256), as he certainly has a right to; for Mr. James himself recognizes (p. 481, footnote) that the 'analogous feeling' principle goes back to the teleology of the movements concerned.

‡ The facts conveyed in this principle seem to me of themselves a strong argument for the discharge theory. Left as Darwin and Wundt state it, all mediating machinery, physiological and psychological, is absent, and we cannot even start a hypothesis as to *how* a feeling (recognizing that it feels *like* another feeling!) sets out along the same afferent paths. Upon the discharge theory the mystery vanishes and we have the practical tautology: like affections of like structures give like feeling, the interest lying in the genetic tracing of the details.

agree that there are no muscles intended primarily for purposes of expression. A psychological translation of this would be that there is no such thing (from the standpoint of the one having the experience) as expression. We call it expression when looking at it from the standpoint of an observer—whether a spectator or the person himself as scientifically reflecting upon his movements, or æsthetically enjoying them. The very word ‘expression’ names the facts not as they are, but in their second intention.* To an onlooker my angry movements are expressions—signs, indications; but surely not to me. To rate such movements as primarily expressive is to fall into the psychologist’s fallacy: it is to confuse the standpoint of the observer and explainer with that of the fact observed. Movements *are*, as matter of fact, expressive, but they are also a great many other things. In themselves they are movements, acts, and must be treated as such if psychology is to take hold of them right end up.

3. I shall attempt to show, hereafter, that this standpoint of expression of pre-existent emotion complicates and aborts the explanation of the relevant facts in the cases of ‘antithesis’ and ‘direct nervous discharge.’ At this stage I wish to point out that in the case of ‘serviceable associated habits,’ the principle of explanation *actually* used, whatever the form of words employed, is that of survival, in the form of attitudes, of acts originally useful not *qua* expressing emotion, but *qua* acts—as serving life. In the discussion of movements in animals (pp. 42–48) the reference to emotion is not even nominal. It is a matter of ‘satisfaction of desire’ and ‘relieving disagreeable sensations’—practical ends. The expressions of grief and of anxiety (Chs. VI and VII) are explained, in their detail, whatever the general phraseology employed, by reference to acts useful in themselves. It would take up too much space to follow all cases in particular, but the book is open and the reader may easily discover whether in every case the idea of

* This, of course, is in no way inconsistent with the development of certain movements to serve as expressive. On the contrary, since movements take place in a social medium, and their recognition and interpretation by others is a fact of positive import in the struggle for existence, we might expect the development of gesture and signs through selection.

expression of emotion does not enter in only to confuse. *The reference to emotion in explaining the attitude is wholly irrelevant ; the attitude of emotion is explained positively by reference to useful movements.*

An examination of one apparent exception may serve to clear up the principle. Of laughter, Mr. Darwin says, "We can see in a vague manner how the utterance of sounds of some sort would naturally become associated with a pleasurable state of mind" (p. 207). But Darwin does not use this idea, even in a 'vague' way. With his inevitable candor he goes on, "But why the sounds which man utters when he is pleased have the peculiar reiterated character of laughter we do not know."

Now I am not so rash as to attempt to deal in detail with laughter and its concomitant features, but I think something at least a little less vague than Mr. Darwin's account may be given. I cannot see, even in the vaguest way, why pleasure *qua* feeling (emotion?) should express itself in uttering sounds. As matter of fact it does not, nor even in smiles;* it is pleasure of a certain qualitative excitement or vivacity which breaks out in laughter, and what we can see, in a 'vague way,' is why excitement affecting the entire organism should discharge in the vocal apparatus. The problem is the discovery of that special form of excited action which differentiates the laugh from other excitations. Observe a crowd of amateurs just from a game. Note how, irrespective of what they say, you can judge whether they have won or lost. In one case postures are erect, lungs frequently expanded, movements quick, abrupt, and determined; there is much gesturing, talking, and laughing in high keys,—a scene which, looking at it 'ejectively,' we term one of liveliness, exhilaration, etc. In the other case there is little speaking, and that subdued; all movements tend to be slow, or, if rapid, indicate a desire to escape or expel something; meditative postures are frequently observed, etc.,—a scene of depression. It is the contrast between spontaneous overflow and lowering of overt activity.

* The 'pleasures' of eating have their characteristic attitude—smacking lips, rolling tongue; the pleasures of sex theirs, etc. Many pleasures are accompanied by holding the breath to maintain the excitation at its maximum, not at all by the expiration found in laughter.

What is the difference? In either case the energy, muscular, nervous and visceral, aroused in the game, persists to some extent. What determines the antithetical lines of discharge of this surplus energy (that antithesis of 'dejection' and 'elation' running through all our terms)? In one case, I answer, there are frictionless lines of action, harmonized activity; or, in more psychological language, all existing kinæsthetic images reinforce and expand one another; in the other case there are two more or less opposed lines of activity going on—the images of the present situation and those of the past game cannot be co-ordinated. The energy is largely directed 'inwards'; that is, it is used up in rethinking the game, in making hypothetical changes, in recalling blunders (that is, images which one wants to expel), etc. The movements appropriate to the present activity cannot be identified with the nervous and motor energies which image the game. In the case of exhilaration, etc., there is identification of the thoughts (the nerve and muscular activities relative to the past game) and the present motor discharges.

The connection between *il penseroso* and melancholy more or less mild, and between *l'allegro* and joy, is thus organic and literal, not one of chance or analogy—as if analogy were somehow a force! When one can put up with his defeat, it ceases to bother him, he does not consider it longer. That is, the 'downcast' emotion and the intellectual reflection vanish together—the moment there is identification of images. The essential identity of the attitudes of thought and of regret is because of the condition of divided activity; there is still a struggle. Means and end are apart. The identity of attitudes of joy and of activity, of life (alert, wide awake, brisk, animated, vivacious, cheerful, gay—showy, lively, sprightly) is because of the unification of activity. Meditation and regret are both activities of arrest, of conflict; joy and 'lively' movement, of stimulation—expansion. No wonder, then, they have the same signs.

Thinking, to be sure, in certain professions, though not for the ordinary man, is an end in itself. In so far as thinking is an end in itself, the activity is unified and has its own joys. It ceases to be occupied with merely instrumental, and (therefore)

more or less burdensome, movements. Yet the pangs, the travail of thought, the arduousness of reflection, the loneliness of meditation, the heaviness of deliberation, are all proverbial. Only in rare cases is the whole system involved or unified, and the joy voluminous. Its ordinary form is the 'thrill' of identification or the satisfaction of 'good taste' in a clear, neat discrimination. When a long and comprehensive process is concluding and approaching its final successful or unified discharge, then, indeed, the hand of a Newton may tremble and joy become intoxicating. But I cannot admit, even in a half-hearted way, the idea that the sense of abundance and ease in thought (James, II. 477) may be purely cerebral.* It appears to me that it is in a literal sense that the object 'sets trains going'—these are revivals of motor discharge and organic reinforcement. Upon such occasions thinking becomes really whole-hearted; it takes possession of us altogether, and passes over into the æsthetic.

This, however, is only preparatory to the question of the specific 'sign' of joy, the laugh. How is that to be brought under this principle of being an actual portion of a useful activity? Why should the excitation, admitting that it affects the vocal organs, manifest itself in this form? While I feel pretty sure of the following explanation, I cannot hope that it will convince many. Though the result of considerable observation, it can be briefly summed up. The laugh is by no means to be viewed from the standpoint of humor; its connection with humor is secondary. It marks the ending (that is, the attainment of a unity) of a period of suspense, or expectation, an ending which is sharp and sudden. Rhythmical activities, as peek-a-boo, call out a laugh at every culmination of the transition, in an infant. A child of from one and a half to two years uses the laugh as a sign of assent; it is his emphatic 'I do' or 'yes' to any suggested idea to which he agrees or which suddenly meets his expectations.

A very moderate degree of observation of adults will con-

* Such distinctions as James makes here—in reality purely verbally—between spiritual and physiological, instead of between cerebral and visceromotor, are what give the opponent the sole reason for labelling the theory materialistic—as if the bowels were really more material than the brain!

vince one that a large amount of laughter is wholly irrelevant to any joke or witticism whatever. It is a constant and repeated 'sign' of attaining suddenly to a point. Now all expectancy, waiting, suspended effort, etc., is accompanied, for obvious teleological reasons, with taking in and holding a full breath, and the maintenance of the whole muscular system in a state of considerable tension. It is a divided activity, part of the kinæsthetic images being fixed upon the immediately present conditions, part upon the expected end. Now let the end suddenly 'break,' 'dawn,' let one see the 'point' and this energy discharges—the getting the point is the unity, the discharge. This sudden relaxation of strain, so far as occurring through the medium of the breathing and vocal apparatus, is laughter. Its rhythmical character seems to be simply a phase of the general teleological principle that all well-arranged or economical action is rhythmical.* The laugh is thus a phenomenon of the same general kind as the sigh of relief. The difference is that the latter occurs when the interest is in the *process*, and when the idea of labor, slow and continuous, is at its height; while the laugh occurs when the interest is all in the *outcome*, the result—the sudden, abrupt appearance of the 'point.' In one case the effort is continued until it accomplishes something; in the other case the effort is arrested, and then the energy accumulated is set free from a seemingly outside source. The connection of humor with the laugh, and the ideas of relative superiority—triviality, and of incongruity, involved in humor, etc., seem to be simply more complex, and more intellectually loaded, differentiations of this general principle.

Not only are joy and grief practically in a peculiar qualitative antithesis, seeming to imply a common principle of which they are the extremes, but the 'signs' of joy and grief, especially when these become violent, are identical. This fact, otherwise so meaningless, becomes natural if we adopt the above explanation. Both crying and laughing fall under the same principle of action—the termination of a period of effort. If we fix our attention upon the conventional and

* Acute crying, etc., is non-rhythmical; when it does take the form of rhythmical sobbing, one experiences a sensation of relief—grief has 'moderated.'

literary conceptions of grief, this will seem far-fetched; if we take children and simple cases, it seems to stare us in the eyes. Crying is either a part of an effort to expel an intruder,* an effort so general as to engage spasmodically the lungs and vocal organs (a sort of general gripe); or, as we see so often in children, an explosion of energy, accumulated in preparation for some act, suddenly discharged *in vacuo* upon the missing of the essential part, the finishing factor of the act.†

Beginning with the simpler case, the phenomena of matured grief become easily explainable. They are phenomena of *loss*. Reactions surge forth to some stimulus, or phase of a situation; the object appropriate to most of these, the factor necessary to co-ordinate all the rising discharges, is gone; and hence they interfere with one another—the expectation, or kinæsthetic image, is thrown back upon itself.

4. In dealing with grief we have unconsciously entered upon a new field. The point of our third head is that the principle which Darwin calls that of ‘movements useful in expressing an emotion’ explains the relevant facts only when changed to read ‘useful as parts of an act which is useful as movement.’ In dealing with grief we have passed over into the phenomena of the breakdown of a given teleological co-ordination, and the performance of acts which, therefore, objectively viewed, are not only useless but may be harmful. My proposition at this point is that the phenomena referred to the principle of direct nervous discharge (the response to an idiopathic stimulus) are cases of the failure of habitual teleological machinery, through some disturbance in one or more of the adjusted members of the habit.

In order to avoid misconception, let me point out a great

* While Darwin's explanation of shutting the eyes—to protect blood-vessels from gorging on account of the violent screaming—undoubtedly accounts for the selection of this attitude, it can hardly account for its origin. I think originally it had the same end as screaming—to shut out or off some threatening object, as the ostrich, etc., or as one shuts his eyes on firing a gun the first time.

† I suppose every one has seen a young child go into a rage of screams and violent movements upon being handed, say, a broken cookie. The thing explains itself on the above principle. The concluding factor in a co-ordination of energy does not appear, and the child goes literally to pieces. I should like to see any explanation upon the anti-James theory, save that offered by Saint Augustine for similar phenomena of his infancy—total depravity.

ambiguity in the use of the term idiopathic. In one sense even the 'associated useful' movements are idiopathic, provided, that is, they originally were useful in reaching an end, and not simply in expressing an emotion. They are the reactions to their appropriate stimuli, and the sole difference between them and the liver changes, nausea, palpitation of heart, etc., usually classed as idiopathic, is that in them stimuli and reaction are more definitely limited to certain particular channels than in the latter cases; there is a defined, as against a vague and diffuse, direct nervous discharge. The fact that this defined discharge happens to be useful may state the kind of idiopathic response we have, but cannot make it other than a response. Furthermore, upon evolutionary principles, the limited, adjusted, and useful discharge must be a differentiation, selected and perpetuated because of its utility in the struggle for life, out of an original more diffuse and irradiating wave of discharge.

Admitting, then, that all emotional attitudes whatever are idiopathic in the broad sense, the sole difference being in the definiteness or limitation of the stimulus and its response, what are we to do with the cases now disposed of as 'idiopathic' in the narrower sense?—such phenomena as Mr. James briefly but excellently sums up on p. 482. My proposition, I repeat, is that all such idiopathic discharges, possessing emotional quality, are in reality disturbances, defects, or alienations of the *adjusted* movements. While not immediately teleological in the sense that they themselves are useful, they are teleologically conditioned. They are cases of the disintegration of associations (co-ordinations) which are serviceable, or are the use of means under circumstances in which they are totally inappropriate.

Idiopathic discharges which are not themselves adjusted movements or the disturbances of such adjusted movements do not appear to me to have any *emotional* quality at all. The trembling with cold or sheer fatigue is certainly qualitatively different from the tremble of rage or fear. The sensations of weakness in the bowels and of nausea, which are idiopathic to their appropriate stimuli, can be called emotional only by such a stretch of the term as renders all sensations and

impulses emotions, Professor James seems to me wholly successful in dealing with the charge brought that, upon his theory, all laughing ought to give the mirthful emotion, all vomiting that of disgust, etc.* The diffusive wave in one case is incomplete; but is there no reason or meaning in this difference? There is no doubt, in my own mind, that, *under existing conditions*, the supplying of the missing organic excitations will change the laugh and the nausea into mirth and disgust as emotions—this without any change in the ‘object.’ But whence and why these ‘existing conditions’? The change from mere cachinnation to mirthful emotion is a distinct change in psychical quality, and this change of quality does not seem to be adequately *accounted* for by mere addition of more discharges—though, I repeat, simply adding on more discharges will undoubtedly *make* this difference. If these supplementary factors report the meaning or value of past co-ordinations, this change of quality is reasonable and inevitable; if not, if they are simply some more accidental discharges, the peculiar qualitative ‘feel’ is miraculous—it admits of no explanation.

This is but to say, from the psychological side, that all normal emotion of terror has an *object*, and involves an attitude *towards* that object; this attitude, under the given circumstances, perhaps not being useful, nay, being harmful, but yet the reproduction of an attitude or, rather, a mixture of attitudes which have been useful in the past. The uselessness of the attitude is due to the fact that some feature in the stimulus (the situation or object) awakens its appropriate reactions, but these do not co-ordinate with the reactions aroused by other features of the situation. The pathological emotion is, as Mr. James calls it, the *objectless* emotion, but its content is controlled by the active attitudes previously assumed towards objects, and, *from its own standpoint*, it is not objectless; it goes on at once to supply itself with an object, with a rational excuse for being.† This immediate correlation of the emotion with an ‘object,’ and its immediate tendency to assume the ‘object’

* PSYCHOLOGICAL REVIEW, No. 5, p. 522.

† The pathological emotion is to the normal as hallucination is to perception. An unusual stimulus takes advantage of and controls the lines of co-ordination and discharge which have been built up with reference to the usual or normal stimulus. Psychologically the process is quite regular; it is only in its teleology that it is ‘off.’

when it is not there, seem to me mere tautology for saying that the emotional attitude is normally rational in content (i. e., adjusted to some end), and, even in pathological cases, sufficiently teleological in form to subsume an object for itself.

In any case, upon James's theory, the admission of any idiosyncratic cases which cannot be reduced to abnormal use of teleological adjustments is more or less intolerable. Their permanent resistance to such reduction would be a strong objection to the theory. Hope, fear, delight, sorrow, terror, love, are too important and too relevant in our lives to be in the main* the 'feel' of bodily attitudes which have themselves no meaning. If the attitude is wholly accidental, then the emotion itself is brute and insignificant, upon a theory which holds that the emotion is the 'feel' of such an attitude.

One more word of general explanation. The antithesis here is between the merely accidental and the adjusted excitation—not between the mechanical and the teleological. I add this because of the following sentence in James: "It seems as if even the changes of blood-pressure and heart-beat during emotional excitement might, instead of being teleologically determined, prove to be purely mechanical or physiological outpourings through the easiest drainage-channels" (II. p. 482). Certainly, if these are the alternatives, I should go a step farther and say that even the clenching of the fist and the retraction of the lips in anger are simply mechanical outpourings through the easiest available channel. But these are not the alternatives. The real question is simply how this particular channel came to be the easiest possible, whether purely accidentally or because of the performance of movements having some value for life preservation. The ground taken here is that the easiest path is determined by habits which, upon the whole, were evolved as useful.†

*In the main, I say; for doubtless it is pedantry to hold that every slight feature of the attitude is conditioned by an activity directed towards an object.

†It is admitted, of course, as Mr. James puts it, that there are "reactions incidental to others evolved for utility's sake, but which would never have been evolved independently" (p. 484). Indeed, in one sense of the term 'incidental' this is a necessary part of my proposition. The only question is whether 'incidental' means purposeless, or means having their purpose not in themselves, but as relative to, as facilitating or reinforcing, some other useful act. The fact, once more,

Coming a little more to details, it is obvious that the teleological principle carries within itself a certain limitation. Normal and usual are identical; the habit is based upon the customary features of the situation. The very meaning of habit is limitation to a certain average range of fluctuation. Now if an entirely strange (forgive the contradiction in terms) stimulus occurs, there will be no disturbance of function, though the organism may be destroyed by the impact of the foreign force. But let some of the features of a situation habitually associated in the past with other features be present while these others fail, or let the ordinary proportion or relative strength of stimuli be changed, or let their mode of connection be reversed, and there is bound to be a disturbance and a resulting activity which, *objectively viewed*, is non-teleological. We thus get an *a priori* canon, as it were, for determining when, in a given emotion, we shall get symptoms falling under the 'serviceable associated habit' principle and when under the idiopathic. Whenever the various factors of the act, muscular movement, nutritive, respiratory, and circulatory changes, are co-ordinated and reinforce each other, it is the former; whenever they interfere (the 'idiopathic'), the 'feel' of this interference is (applying the general principle of James) the pathological rage, or terror, or expectation.

Once more, we work in a wrong, a hopeless direction when we start from the emotion and attempt to derive the movements as its expression; while the situation clears itself up when we start from the character of the movement, as a completed or disturbed co-ordination, and then derive the corresponding types of normal and pathological emotion. We can understand why the so-called idiopathic principle comes into play in all cases of extreme emotion, the maximum limit seeming to be the passage into spasm when it assumes a rigid type, of hysteria when it involves complete breakdown of co-ordination.

The attitude of normal fear may be accounted for upon direct teleological principles; the holding of breath marks

that upon Darwin's method of statement no such relative or incidental movements can be admitted is an undoubted objection to Darwin's mode of statement of the principle of useful habit.

the effort; the opening of mouth, the act arrested half-way; the opening of eyes, the strained attention; the shiver, of retraction; the crouching down, the beginning of escape; the rapid beating of heart, the working up of energy for escape, etc. Now if these activities go on to complete themselves, if, that is, they suggest the further reaction which will co-ordinate into a definite response, we get judicious fear—that is, caution. Now if these do not suggest a further movement which completes the act, some or all of these factors begin to assert themselves in consciousness, isolatedly or in alternation—there is confusion. Moreover, each particular phase of the act which is normal in co-ordination, as the more rapid beating of the heart, being now uncontrolled by lack of its relevant motor associates, is exaggerated and becomes more and more violent. The response to the normal demand for more nutrition finds no regular outlet in supplying the motor-energy for the useful act, and the disturbances of viscera and associated organs propagate themselves. The trembling marks, so far as I can see, simply this same disco-ordination on the side of the muscular system. It is the extreme of vacillating indecision; we start to do this, that, and the other thing, but each act falls athwart its predecessor.

Speaking roughly, there is exaggeration of the entire vegetative functions of the activity, and defect of the motor side—the unstriated muscles being included, on a functional basis, with the vegetative system. Now this is just what we might expect when there is a great stirring up of energy preparatory to activity, but no defined channel of discharge. Thus the agent becomes entirely taken up with its own state and is unable to attend to the object.

The pathological emotion is, then, simply a case of morbid self-consciousness. Those factors of the organism which relate most immediately to the welfare of the organism, the vegetative functions, absorb consciousness, instead of being, as they normally are, subsidiary to the direction of muscular activity with reference to the 'object.' This is equally true in extreme terror, and in being 'beside one's self' with anger. The cases in which sanguine excitement and apprehension affect the bladder will be found, I believe, to be almost uni-

formly cases where it is not possible to do anything at once with the aroused activities; they cannot be controlled by being directed towards the putting forth of effort upon the 'object,' that being too remote or uncertain.

Certainly, the principle for attitudes commonly called those of morbid self-consciousness is precisely the one just laid down. In these cases muscular (not vegetative) functions normally useful in the attainment of an end are first aroused in response to stimuli, and then, not being completely co-ordinated into action, are *not* used with reference to the end, and so stand out in consciousness on their own account. I shall not attempt any detailed statement here, but leave it to the reader to answer if the above does not give a precise generic description of the sensations of awkwardness, of bashfulness, of being ridiculous (as when one starts an appropriate movement, but is made conscious of it in itself apart from its end) on one side, and of affected grace, mincing ease, pomposity and conceit on the other.

All these facts taken cumulatively seem to me to render it fairly certain that the 'idiopathic' cases, as a rule, are to be conceived of as the starting of activities formerly useful for a given end, but which now, for some reason, fail to function, and therefore stand out in consciousness apart from the needed end.

5. I come now to the principle of antithesis. According to Mr. Darwin, when certain movements have been habitually of service in connection with certain emotions, there is a tendency, when a directly opposite state of mind is induced, to the performance of movements of a directly opposite nature, *'though these have never been of any use'* (p. 50, italics mine). Here we have a crucial case; if the antithesis of the emotion determines the antithesis of expression, James's theory is, in so far, overthrown; if, on the other hand, the antithesis of 'expression' goes back to activities having their own ends, the ground is at least cleared for the discharge theory.

Beginning with animals, Mr. Darwin illustrates his principle of antithesis from the cat and dog. No one can read his account or examine the pictures without being convinced that the movements *are* antithetical. But there is something

intolerable to the psychologist in the supposition that an opposite emotion can somehow select for itself channels of discharge not already used for some specific end, and those channels such as give rise to directly opposed movements. Antithesis is made a causal force. Such an idea is not conceivable without some presiding genius who opens valves and pulls strings. The absence of mediating machinery, of inter-linking phenomena, is even more striking in this case than in that of 'analogous feeling.'

If, again, the matter be treated as a case of the connection of movements with reference to certain acts, the mystery vanishes. Mr. Darwin's cases are taken from domestic animals. Now wild animals have, speaking roughly, just two fundamental characteristic attitudes—those connected with getting food, including attack upon enemies, and those of defence, including flight, etc. A domestic animal, by the very fact that it is domestic, has another characteristic attitude, that of reception—the attitude of complete adaptation to something outside itself. This attitude is constituted, of course, by a certain co-ordination of movements; and these are antithetical to those movements involved in the contrary attitude, that of resistance or opposition. A study of the dogs upon pp. 52–55 will show that the attitude of opposition is naturally self-centred and braced, the best position from which to fall, on one side, into an attitude of overt attack, and, upon the other side, into that of resistance to attack. The attitude of 'humility' and 'affection' consists, as Mr. Darwin well says, in continuous, flexuous movements. These movements are precisely those of response and adaptation. The centre of gravity is, as it were, in the master, and the lithe and sinuous movement is the solution of the problem of maintaining balance with respect to every change in this external centre of gravity. It is the attitude of receiving favor and food from another. The dependence is actual, not symbolic. Unless Mr. Darwin were prepared to equip the animal with a full-fledged moral consciousness, the 'humble' attitude of the dog can hardly be other than the habitual attitude of reception, or the 'affectionate' attitude other than the recurrence of movements associated with the food-getting. The same general principle will apply

to the antithetical cat expressions, save that the dependence in the case of the cat assumes more the form of passive contact and less that of active adjustment. The reminiscence of sexual attitude is possibly also more marked.*

The other cases of antithesis given by Mr. Darwin are the shrug of impotence, and the raising of the hands in great astonishment. I feel certain that the rational hypothesis is to suppose that these are survivals of certain acts, and not symbolic indications of certain emotions. As a contribution to such a working hypothesis, I suggest the possibility that the throwing up of the arms in attention is partly the survival of a movement of warding off the approaching hostile object, and partly a reinforcement of the holding of the chest full of air characteristic of expectancy and of astonishment—a movement whose analogue is found in the raising and drawing back of the arms in yawning.† The shrug of impotence seems to be complex; the union of survivals of three or four distinct acts. The raising of the brows is the act of retrospect, of surveying the ground to see if anything else could have been done; the pursing of the lips, the element of tentative rejection (doubt); the raising of the shoulders, the act of throwing a burden off (cf. 'he shouldered it off on some one else'); the holding out of the hand, palm up, the attitude of asking or taking. To my introspection the *qualé* of the emotion agrees entirely; it is a feeling of 'I don't see how I could possibly have done anything else, so far as I am concerned, but I'm willing to hear what you have to offer'—of 'I don't know; you tell.' It thus has the distinctly expressive or social element in it, and marks the passing over of emotional attitude into gesture.

Summing up, we may say that all so-called expressions of

* Being unable to do anything with these cases, I called them to the notice of my friend and colleague, Mr. G. H. Mead. The explanation given, which seems to me indubitable, is his. The relation between the vegetative and the motor functions, given above in discussion of pathological emotion and to be used again below, I also owe to him. While I have employed the point only incidentally, Mr. Mead rightly makes it essential to the explanation of emotion and its attitudes, as distinct from the identification and description which alone I have attempted. I hope, therefore, that his whole theory may soon appear in print.

† Since writing the text, I have repeatedly noticed this attitude of the arms, without the rigidity, assumed by a child of two years while watching the preparation of his food.

emotions are, in reality, the reduction of movements and stimulations originally useful into attitudes. But we note a difference in the form and nature of the reduction, and in the resulting attitudes, which explain the apparent diversity of the four principles of 'serviceable associated habits,' of 'analogous stimuli,' of 'antithesis,' and of 'direct nervous discharge.' A given movement or set of movements may be useful either as preparatory to, as leading up to, another set of acts, or in themselves as accomplished ends. Movements of effort, of bracing, of reaching, etc., evidently come under the former head. Here we have the case of useful associated movements in its strict sense. The culmination of all these preparatory adjustments is the attainment of food or of the sexual embrace. In so far as we have attitudes which reflect these acts, satisfying in themselves, we get cases of so-called analogous stimuli. The antithetical attitudes of joy and grief, and all that is differentiated from them, mark the further development of actual attainment of an end, (or failure to get it) occurring when the activity specially appropriate to the particular end reached (or missed) is reinforced and expanded by a wide range of contributory muscular and visceral changes. The cases of failure bring us to the breakdown of co-ordinations habitually useful, to their alienation, or to reciprocal disturbance of their various factors, and thus to the facts usually subsumed under the idiopathic principle. In this progression we have a continually changing ratio of the vegetative to the motor functions. In the preparatory adjustments the latter has the highest exponent, and the strictly emotional *quale* of feeling is at its minimum. In joy and grief, as in less degree with 'sweetness,' disgust, etc., the organic resonance is at its height, but strictly subservient to the motor performances. In the idiopathic these vegetative functions break loose and run away, and thus, instead of reinforcing the efficiency of behavior, interfere by their absorption of consciousness.

In the following article I shall take up the discharge theory of the nature of emotion, and discuss it in the light of the conclusions now reached.