MIND

A QUARTERLY REVIEW

OF

PSYCHOLOGY AND PHILOSOPHY

I.—THE TIME QUALITY.

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I.

Sec. 1. When a number of years ago I published my *Pain, Pleasure and Æsthetics* I presented for examination the hypothesis that Pain-Indifference-Pleasure are diverse phases of a general quality of all presentations, which we may call the Algedonic Quality, and which is of such a nature (1) that one of its three phases is necessarily given in connexion with each elementary presentation; (2) that no more than one of the three phases can at the same moment be given in connexion with any special elementary presentation; (3) that if the proper conditions exist any one of the three phases may be given in connexion with any elementary presentation; and (4) that the state of indifference is as it were a *norm* from which pleasure and pain respectively appear as departures in opposite directions.¹

A careful examination of the subject convinced me that the theory thus presented could be maintained successfully, provided it was assumed that the algedonic quality is of

¹ This is distinctly a psychological hypothesis. In examining it I took occasion to inquire how far it is compatible with the hypothesis that each differentiation of an individual's consciousness corresponds with a differentiation of the form of activity in the individual's nervous system. If I may judge from reviews of the book, and subsequent quotations, my discussion of the "physical basis of pleasure and pain" has for some reason appeared to many of my readers to be of more importance than the psychological theory which it was intended to elucidate. With this conclusion I cannot agree.

an elemental character: i.e., that it would be displayed by psychic elements if such could exist in isolation, as is of course impossible, for the reason that consciousness as appreciated is necessarily systematic and not a mere aggregation of psychic atoms.

If we are convinced of the truth of this algedonic hypothesis, we are naturally led to ask whether there may not exist some other general quality of all presentations of a similar three-phased nature which would not be given but for the complexity of presentations as experienced.

When we turn our thought in this direction, we cannot but be struck by the fact that our experiences in relation to time have a very marked similarity in many respects with our experiences of the algedonic quality. As with the algedonic quality, the time quality, if we may so speak, (a) displays three phases, past time, present time, and future time; (b) one of which seems necessarily attached to each presentation; any one of which seems to be attachable to any given presentation if the proper conditions are given; (c) each of which seems to be exclusive of the other two in relation to any special presentation; (d) two of which, *viz.*, past time and future time, appear as contradictory opposites, while the third appears as a *norm* as it were from which the other two seem to depart in opposite directions.

Let us consider for a moment somewhat more in detail the facts which suggest this likeness of form between algedonic and time phases.

Sec. 2. (a) In the first place it seems fairly clear that each presentation within consciousness, when considered from a special point of view, is discovered to be describable either as relating to the past, or to the present, or to the future. It is true, of course, that we often experience presentations without appreciating their time relations, just as we experience presentations without appreciating their intensity, or their algedonic quality; but no presentation seems to arise without displaying characteristics which may in any instance lead to the appreciation of some time phase, so that it is then found to display either what we may speak of as presentness, or else pastness, or else futureness.

(b) In the second place we note many cases where what we call the same presentation displays the different time phases under different conditions: *e.g.*, this moment's thought, "a game of golf," may have pastness if I played yesterday, or presentness if I am in the midst of the game, or futureness if I am on my way to the golf course. Furthermore there may be a rapid shifting from one time phase to another

without other noticeable change in the presentation: when walking to the golf course the thought, "game of golf," may be placed now in the past, and immediately afterwards in the future.

Again there are cases where, provided we recognise multiple emphases within the same complex presentation, we seem to note all of the time phases together; one being given emphatically, the others dimly: consciousness thus appears as involving a present, together with what Prof. James calls "backward and forward fringes". This would indicate that as each presentation is highly complex, so the parts of the complex may appear in different time phases at one and the same moment; very much as we note summational states of mixed pleasure and pain.

(c) But evidently even where this occurs it appears that prominence of one time phase in relation to a given presentation excludes the prominence of either of the other two time phases at the same moment. The same idea cannot be thought of as distinctly present, and at the same moment either as past or future; nor as distinctly past, and at the same moment as present or future; nor as distinctly future, and at the same moment as present or past.

(d) It is so clear that past time and future time are appreciated as contradictory opposites, and that present time is as it were a *norm* in relation to which the past and future are estimated, that no further comment is necessary here in relation to this point.

This superficial view serves to strengthen our first suggestion; and evidently makes it worth our while to look into the matter with some care.

II.

Sec. 3. At the very beginning of this inquiry it may be well to say a word to forestall criticism from some reader to whom it may occur that in any discussion of the nature of the time quality we must find ourselves assuming a time series in the objective world, and events in time, and that we shall thus be found to base our explanations upon data which involve the apprehension of time itself.

But we have reason to contend that as psychologists we are fully warranted in this procedure. We assume successive events exactly as we assume the existence of objects in the outer world. All of common speech, and all of scientific expression, involve the assumption of the existence of objects in the outer world, and involve in like manner the assumption

of what we call successions of changes in this outer world of objects. The difficulties referred to are of a metaphysical nature with which the psychologist as such does not directly concern himself. In the words of Dr. James Ward,¹ we "have not to ask how time itself comes to be, but assuming it to be, we ask how the individual comes to know it". Assuming the existence of successive moments of time in the life of a complex neural system, and in that of a coincident consciousness which is a complex psychic system, it is our object to inquire into the nature of the quality given in any special moment, any "now" of this psychic existence, by the fact that this special moment was preceded and will be followed by other special moments, by other "nows".

Sec. 4. Although we might thus waive this difficulty we do not find it altogether necessary to do so. For even though timeness be a general quality of presentations, when it is recognised as such in any of its phases it is appreciated in reflexion as a special "feeling of relation" which is itself a specific form of presentation of the same type as those "feelings of relation" which Dr. James speaks of as the "feeling of *but* the feeling of *and*," etc. When we appreciate the time phase of a given presentation it is because its special "feeling of relation," or "sense of relation" as I prefer to call it, is given at the moment.

When then we assume the existence of successions of presentations we are really experiencing in the "now" a given complex presentation in which we appreciate a number of minor presentations together with a recognition of a relation of succession between them: and evidently when in a specific presentation we have given what we call a series of presentations we are dealing with what is a very different thing from a description of the successive presentations themselves.²

¹ *Enc. Britannica*, Art. "Psychology," p. 64. Cf. also Dr. Stout in his *Manual of Psychology*, p. 884, where he says: "Without ideal representation there could be no such thing as the definite apprehension of a time series, having a distinguishable beginning and end, connected by a train of intermediate events, each having its own position in the series determined by its relations to other events which come before and after it. For perceptual consciousness it is evident that time cannot exist in this form. On the other hand, we find in perceptual consciousness those primary experiences on which our developed apprehension of time is ultimately based."

² For clear statements of this distinction cf. Stout, *Manual of Psychology*, p. 385; Royce, *World and the Individual*, ii., p. 115 ff. As Dr. Jas. Ward says (*Enc. Brit.*, Article, p. 66): "On the whole we may conclude that our concrete time experiences are due to simultaneous representations of a series of definite presentations both accompanied and separated by more or fewer indefinite presentations more or less con-

If we refer to three specific presentations, say 1, 2 and 3, we grasp them as a series of any kind in a complex presentation which involves a number of minor presentations or psychic emphases¹ which may be symbolised thus:—

1, plus 2, plus 3, plus { The "sense of relation" which we describe as the relation peculiar to the series.

So of three presentations of successive moments, $\dot{P}$, $\ddot{P}$, $\ddot{P}$, we grasp them as a time series in a complex presentation of multiple emphases which may be symbolised as follows:—

$\dot{p}$, plus $\ddot{p}$, plus $\ddot{p}$, plus { The "sense of relation" which we describe as the relation involving pastness, presentness, or future-ness as the case may be.

It would appear then that the pastness of a given presentation is appreciated because of the emphasis of a certain specific sense of relation; and that presentness, and future-ness, are appreciated because of the emphasis of certain other but closely related senses of relation: and we thus see that in this study we are dealing altogether with an analysis of what we assume may be certain aspects of all forms of presentation.

III.

Sec. 5. In undertaking this inquiry we must note certain points of significance which require full explanation if we are to maintain our hypothesis that the appreciation of time is due to the existence of a general three-phased quality which exists in one phase or another in connexion with each presentation.

In the first place it will be necessary to account for the fact briefly referred to above that while from one point of view each presentation in a given moment is appreciated as in a sense qualified by one, and only one, of the three time phases; nevertheless from a certain other point of view every

fused; that, further, the definite presentations have certain marks or temporal signs due to the movement of attention; that the rate of these movements or accommodations is approximately constant; and that each movement itself is primarily experienced as an intensity".

¹ As I have elsewhere stated; if the action of the nervous system as a whole is considered in any given moment, inasmuch as each nerve part is in some measure active, what we call special activities may well be described as neururgic emphases; and the presentations which correspond with these neururgic emphases may well be described as psychic emphases within the whole complex psychic system,—i.e. the consciousness,—of the moment. I use the word neururgic here, as I have in previous articles, with the meaning "relating to the activity of nerve".

presentation which is distinctly recognised as present,—as qualified by presentness,—has attached to it also something of both pastness and of futureness in what Dr. James calls the “backward and forward fringes”.

It is this experience which leads us to describe consciousness as a whole as a stream,¹ in part ever flowing towards us, in part being with us, in part ever flowing from us: a stream which appears constantly to leap as does a torrent over a brink, from which it approaches us, and as constantly passes us by and flows away like a river across a broad plain until it is lost in the vague horizon mists.

Sec. 6. We are thus brought to the consideration of a second point of great interest which also demands explanation.

In speaking of consciousness as a stream we are using spatial terms, and when we come to think of it we find that we are in the habit of thus employing spatial terms constantly in our references to the several time phases. The past is felt to be fittingly described as that in our experience which is going from us; the future as that in our experience which is coming to us; the present as that in our experience which is here with us.

This use of terms would surely seem to indicate that the form of presentations which is given when we recognise pastness, is given with especial emphasis in connexion with our perceptions of objects in the outer world from which we are being separated; that the form which is given when we recognise futureness, is given with especial emphasis in connexion with our perception of objects in the outer world to which we are approaching, or which are approaching us; and that the form which is given when we recognise presentness, is one which is emphasised when objects in the outer world which attract our notice are in a stationary relation to us. The significance of this point will appear as we proceed.

Sec. 7. We may note here also another point of importance in this connexion, *viz.* that this time stream moves always in one direction.

As we have seen above, in considering in reflexion the time quality as a whole we are dealing with the appreciation of the characteristics of a series of presentations in one complex presentation. Now spatial series, for instance, when thus studied may be considered equally well from right to left or from left to right, up and down or down and up. But such is not the case with the time series.

¹*Cf.* W. James, *Psychology*, vol. I., ch. ix.

And evidently as Prof. Royce says "this direction of the stream of time forms one of its most notable characteristics". Even when we consider reversible spatial series, through them all appears the temporal characteristics of the stream of presentations itself which is always in our direction and irreversible. When we contemplate such series as the spatial series we feel no sense of aid or opposition in them due to the existence of a steady current; but when we contemplate the time series we always appreciate the influence of a current moving steadily and inevitably in one direction, with which we move easily, against which we must struggle if we are to maintain our position.

Sec. 8. Finally we are here led to note another point which appears upon careful study and which has especial significance, *viz.* that the several time phases, even what we call the present, always appear, in a "now," as related to what we in reflexion perceive to be really not of the present, but of the just past. Even our every day "present" is really a secondary presentation or revival; it is a state of reflexion in a given "now" upon what is a just-gone; and this fact has led Mr. E. R. Clay to describe what we in common language call the present as a "specious present". In what follows when I speak of presentness, or of the present, I refer to this form discovered in revivals, *i.e.* to what we would call in Clay's phraseology "specious presentness" and the "specious present," and do not refer to the "now" of experience in which this is appreciated.

Sec. 9. The fact referred to in section 7, *viz.* that the time series moves in one direction only, and that this direction of the flow is irreversible, would seem to indicate that the three time phases are due to modifications of one general characteristic of successive presentations as these are appreciated in a complex presentation of reflexion.

The fact referred to in section 8, *viz.* that all presentations upon close inspection appear to be relegated to the past, surely means that the pastness sense of relation is more pervasive than the presentness or futurelessness senses of relation; and this would seem to imply that in pastness we have the general characteristic of successive presentations referred to in the preceding paragraph; and that in considering the time quality we are dealing with a general typical form of all presentations which is markedly emphasised in those cases in which distinct pastness is recognised; which is not thus emphasised in those cases in which presentness (or "specious presentness") is recognised; and which is considerably modified in those cases in which futurelessness is

recognised. For such a typical form of all presentations which is thus modified when the time phases are definitely appreciated we may well make search.

IV.

Sec. 10. It is evident from what we have just said that we are likely to be repaid by a careful examination of the characteristic of pastness which is evidently a more pervasive form of presentations than either presentness or futureness.

When we study pastness with care we note one characteristic of it which is worthy of our consideration, *viz.* the fact that it is always connected with a reduction of presentative complexity. As Herbert Nichols well says:¹ "In order to perceive Past, some sensation or image must cease; whenever any such ceases, we perceive Past. The ceasing of the perception is the perception of Past; did no perception ever cease we should never perceive or know anything whatever regarding Past, or pastness, or about the Past. . . . For any apperception of Past the cessation of some sensation or image must call up some idea of Past, of something ceasing."

We are thus led to see that the nature of the complexity of successive presentations may well be of importance in relation to the existence of the time quality and of its special phases. Let us then turn for a moment to the consideration of this presentative complexity in itself.

Sec. 11. All presentations of reflexion are as we all agree of a highly complex nature, corresponding with complex emphases within the neururgic system. This complexity is partly due to the fact that the neururgic system is acted upon by a variety of stimuli at the same time; but clearly it is principally due to the fact that this neururgic system is acted upon by a variety of stimuli in successive moments, the effects of one moment's stimulations still persisting as minor neururgic emphases, in moments when new stimulations are giving rise to other and new neururgic emphases.

A specially important mode of this neururgic complexity is given in the fact that the human animal lives in an environment of never-ceasing change, in which there is a constant alteration of the position of the sources of stimulation in relation to the human body, either through the movement of these sources of stimulation in relation to the man, or through the man's own movements in relation to his surroundings; these changes of relative position involving great

¹ *Psychology of Time*, p. 123.

diversity in the power and nature of the stimuli which reach the man's body. Countless sources of stimulation are thus always coming nearer to him and thus becoming more effective to produce minor neururgic emphases within the whole major emphases; and countless other sources of stimulation are always being separated from him and thus becoming less effective to produce these minor neururgic emphases.

It is clear then that if the "neururgic patterns"¹ in man are considered as wholes they must display constantly varying modes of complexity which are determined by the fact that the important sources of stimulation are either coming nearer to him; or are approximately stationary in relation to him; or are becoming separated from him. That is to say, if we view successive neururgic patterns in comparison, they clearly must display either:—

(1) A developing complexity due to the man's approach to effective sources of stimulation, or to their approach to him; or else

(2) A stationary condition of complexity due to his retention for the moment of a fixed relation to these effective sources of stimulation; or else

(3) A simplifying complexity, due to his departure from the effective sources of stimulation, or to their departure from him.

It seems clear also that these characteristics of relative complexity which are so important to the inception of activities in the nervous system must, in consequence of the retentiveness displayed by neururgic systems, also be displayed in all forms of successive neururgic patterns if they are viewed in comparison: so that if we thus view successive neururgic patterns we must in all cases find their emphases displaying what we may call a characteristic of a three-phased nature, involving

(1) Either a developing complexity, or

(2) A stationary complexity, or

(3) A simplifying complexity.

It furthermore appears that any two successive neururgic patterns, if taken as wholes, when viewed in comparison must frequently display very distinctly one of these phases of this characteristic of three-phased nature; and that they cannot in any given moment display more than one of them thus distinctly. If the relation here referred to is noted at all, the successive neururgic patterns must display either a

¹ Cf. my articles in this Journal, N.S., No. 44, p. 479 ff., and N.S., No. 57, p. 62 ff.

developing, or a stationary, or a simplifying complexity; and they cannot display very markedly one of the three without the preclusion of the appearance of the other two.

This characteristic given to primary neururgic patterns originally by the form of environmental stimuli will evidently be maintained in all reverberations of these primary complex reactions. We must thus have given a characteristic of all neururgic patterns which will involve three phases; a norm, as it were, and departures in one of two opposite directions from this norm: and we note that this norm will be brought into greatest prominence when the man is effectively stimulated by objects which are stationary in relation to him; while the departures from this norm will be brought into greatest prominence when the man is effectively stimulated respectively by objects coming towards him, and by objects which are moving from him.

Sec. 12. If there is any truth in the hypothesis of a thoroughgoing neururgic and noetic correspondence, then surely we should expect to find in consciousness some general characteristic or quality of presentations corresponding with this three-phased characteristic of neururgic emphases. We should expect to find in all presentations as viewed in retrospect a quality dependent upon their developing, or stationary, or simplifying complexity; a quality of such a threefold nature that (1) one of the three forms of the quality must appear in relation to each complex presentation if considered in reflexion; (2) that, under the proper conditions, any one of the three forms may appear; and (3) that the emphasis of one form must necessarily preclude the emphasis of either of the other two, if the field of presentations is considered as a whole.

Moreover if such a general quality of presentations exists, we clearly might expect to find ourselves picturing it to ourselves in terms of our spatial conceptions: for although if looked for it would be always observable, it would correspond in its most emphatic forms with our movements in relation to objects in space, or with their movements in relation to us, these spatial objects being so far the most effective sources of emphatic presentations that we always tend to describe our experience in spatial terms.

The question we then find ourselves asking is whether we note in reflexion any general quality of presentations of a three-phased nature which we habitually describe in terms which have special relation with objects coming to us, or with those stationary in relation to us, or with those going from us: and we at once agree that we do observe what

may be called such a three-phased general quality in the Time Quality, which must always appear either in the form of pastness, or presentness, or futureness; and which as we have seen is most commonly described in spatial terms: pastness being thought of always as involving something going from us; presentness as involving something with us; futureness as involving something coming towards us.

Sec. 13. It may possibly appear to some reader that this theory might be put to a crucial test by producing, by mechanical means, increases and decreases of presentational complexity, and observing whether or not the appreciation of futureness and of pastness respectively are noticeable in reflecting upon the presentations thus given. And it might be claimed that such changes of perceptual complexity do not self-evidently involve such distinct recognition of what we might expect to be their appropriate time phases.

But it is to be noted that artificially produced increases and decreases of the complexity of stimulations from objects in fixed relation to us do give us respectively a sense of coming to us, and going from us: instance the effects of musical *crescendos* and *decrescendos*, and of growing and waning intensities of fixed lights. And as we have seen the coming to us aspect of presentations is closely related to futureness, while their going from us aspect is closely related to pastness.

Beyond this however it is to be noted that such conditions of experiment as we here refer to would give rise to attention to perceptual presentations due to objects before us, which we have become accustomed by an immense body of experience to identify with the "now-here" from which futureness and pastness are excluded. Furthermore there is ground for holding that the variations in complexity with which futureness and pastness are identified are mainly those in the realm of secondary presentations which do not include the primary presentations of perception such as are involved in the cases of the supposed experiment of mechanically induced increases and decreases of complexity.

V.

Sec. 14. Let us now attempt to symbolise in formulæ the nature of typical presentations in general, and of those special presentations in which the time relations become explicit, to see whether the conception of the relation of the time phases to presentative complexity is corroborated by such a consideration.

A.

In an article entitled "Presentation and Representation" already published in this Journal (N.S., No. 57), I have noted (sec. 12) that the simplest conceivable neururgic emphasis in the adult man is given if one supposes himself aroused from a deep slumber, say by a crash of thunder or by a glare of light. The deep slumber involves as close an approximation as is possible for the adult man to a dead calm on the neururgic wave surface which we have used as a simile; and upon this relatively calm surface appears suddenly a high wave.

This high and practically isolated wave on the neururgic surface involves a marked psychic emphasis or presentation within consciousness; and this, as we have seen in the article above referred to, may be represented by the symbol¹

$$(A) \left\{ \begin{array}{l} {}^*P^1 - 2 - 3^{2456} \times 6 \\ {}^*p^1 - 2 - 3^{2456} \times 6 \end{array} \right\}.$$

For, as the reader will recall, we have seen reason to believe that each primary presentation or impression (${}^*P^1 - 2 - 3^{2456} \times 6$ in the above symbol) has bound up with it what would be a secondary presentation, or image (${}^*p^1 - 2 - 3^{2456} \times 6$ in the above symbol) if the direct action upon us from the environment were lacking. He will also recall that the psychic system tends to absorb, as it were, the psychic emphases or presentations which accrue to it, and this results in the gradual disappearance as partial presentations from moment to moment of the less marked minor emphases in any given complex presentation, until finally it as a whole disappears as a presentation. This leads us to symbolise any special presentation in three successive moments, two of which follow an impression in moment 1 which is lacking in moments 2 and 3, by the symbols

$$(A) \left\{ \begin{array}{l} {}^*P^1 - 2 - 3^{2456} \times 6 \\ {}^*p^1 - 2 - 3^{2456} \times 6 \end{array} \right\};$$

$$(B) \quad {}^*P^1 - 2 - 3^{2456};$$

$$(C) \quad {}^*P^1 - 2 - 3^{2456}.$$

¹ For the convenience of the reader I would remind him that the large P 's symbolise any primary presentations or impressions: the small p 's symbolising the corresponding secondary presentations, or so-called representations or images. The Greek letters over the P 's and p 's indicate that the presentation of any moment differs from what we call the same presentation of the previous moment, in that the noetic pattern of

If however the emphatic stimulation continues during the three successive moments, then the presentations of the three moments, as we have already seen, may be symbolised as follows:—

$$\begin{aligned} (1) & \left\{ \begin{array}{l} \overset{a}{p}^{1-2-3^4 \times 5} \\ \overset{a}{p}^{1-2-3^4 \times 5} \end{array} \right\}; \\ (2) & \left\{ \begin{array}{l} \overset{\beta}{p}^{1-2-3^4 \times 5} \\ \overset{\beta}{p}^{1-2-3^4 \times 5} \end{array} \right\}; \overset{a}{p}^{1-2-3^4 \times 5}; \\ (3) & \left\{ \begin{array}{l} \overset{\gamma}{p}^{1-2-3^4 \times 5} \\ \overset{\gamma}{p}^{1-2-3^4 \times 5} \end{array} \right\}; \overset{\beta}{p}^{1-2-3^4 \times 5}; \overset{a}{p}^{1-2-3^4} \end{aligned}$$

If now a total darkness ensues in moment 4; and if in this moment we reflect upon the presentation 3 as a whole, and discern in it some special character, we may symbolise the presentation of moment 4 as follows:—

$$(4) \overset{\gamma}{p}^{1-2-3^4 \times 5}; \text{ plus } \overset{\beta}{p}^{1-2-3^4}; \text{ plus } \overset{a}{p}^{1-2-3}; \text{ plus } \left\{ \begin{array}{l} \text{a "sense of relation"} \\ \text{determined by the} \\ \text{nature of the pre-} \\ \text{sentations } \overset{a}{p}, \overset{\beta}{p} \\ \text{and } \overset{\gamma}{p}. \end{array} \right.$$

Formula 3, as representing the simplest possible state of adult experience, has already been given on page 73 of my article on "Presentation and Representation" already referred to, and as we there saw may be looked upon as typical of all presentations. *It will be noted that it involves a simplification of complexity in the several minor emphases, $\overset{\gamma}{p}$, $\overset{\beta}{p}$ and $\overset{a}{p}$.*

Sec. 15. Now all sorts of presentations occur which have all sorts of emphatic forms; and it is not difficult to show that if we use similar symbols the form of the presentation of reflexion upon a state occasioned by a powerfully stimulative object which is moving from us is one in which the typical form of all presentations given in 3 above is very much emphasised.

If a powerfully stimulative object is moving from us the effect of this separation from the object must be to obliterate from moment to moment the efficiency of certain of the

each moment is affected by the fact that previous noetic patterns have existed. The numbers indicate the minor emphases within the total psychic emphasis P , the marks between the numbers indicating relations of any nature which may happen to exist between these minor emphases.

elements of the stimulus coming to us from the object; and correspondingly certain partial presentations within the complex presentation must disappear from moment to moment. That is to say, the simplification of complexity observable in all presentations of reflexion, as typified in formula 3, will be greatly emphasised when we perceive objects which are moving from us, or from which we are moving.

If we assume that the flash of light by which the man is awakened from deep sleep is moving rapidly away from him, the presentations of three successive moments may be symbolised as follows:—

$$\begin{aligned} (1a) & \left\{ \begin{array}{l} {}^a P^{1-2-3-4-5-6} \\ {}^a p^{1-2-3-4-5-6} \end{array} \right\}; \\ (2a) & \left\{ \begin{array}{l} {}^{\beta} P^{1-2-3-4} \\ {}^{\beta} p^{1-2-3-4} \end{array} \right\}; \quad {}^a p^{1-2-3-4-5-6} \\ (3a) & \left\{ \begin{array}{l} {}^{\gamma} P^{1-2} \\ {}^{\gamma} p^{1-2} \end{array} \right\}; \quad {}^{\beta} p^{1-2-3}; \quad {}^a p^{1-2-3-4} \end{aligned}$$

Here the "dropping out" due to the separation from us of the stimulating object is symbolised by omitting the figures 5 and 6 in connexion with ${}^{\beta}P$, and the figures 3 and 4 in connexion with ${}^{\gamma}P$.

If then we reflect upon this state (3a) as a whole (if we state this in a form related to the serial arrangement of the occurrence¹) we have

$$(4a) \quad {}^a p^{1-2-3}, \text{ plus } {}^{\beta} p^{1-2}, \text{ plus } {}^{\gamma} p^1, \text{ plus } \left\{ \begin{array}{l} \text{the "sense of relation" de-} \\ \text{termined by the nature of} \\ \text{the three partial emphases} \\ {}^a p, {}^{\beta} p, {}^{\gamma} p. \end{array} \right.$$

But it is to be noted that this formula is exactly correspondent with the typical formula (4) given above representative of the nature of all presentations in reflexion; except that in the latter case (4a) the simplification of complexity would appear as greatly emphasised in relation to any revival of the original presentation

$$\left\{ \begin{array}{l} {}^a P^{1-2-3-4-5-6} \\ {}^a p^{1-2-3-4-5-6} \end{array} \right\}.$$

¹ The fact that in this symbolisation the simplification appears in (4a) in a form which, so far as the Greek letter distinction is concerned, is inverted (see (4)) is of no significance, inasmuch as each of the minor emphases ${}^a p^{1-2-3-4-5-6}$, and ${}^{\beta} p^{1-2-3-4}$, and ${}^{\gamma} p^1$, is appreciated in one and the same moment, as inherent in one more complex emphasis.

Sec. 16. What this means then is that a form determined by simplification of complexity is given in *all* presentations; which form is given very emphatically whenever we experience those special presentations due to objects which are being separated from us: and we thus see that it is most natural for us to describe this general characteristic of all presentations in terms used to describe the emphatic form of presentations due to our perception of objects moving from us: we may therefore quite naturally describe this general characteristic of all our presentations as viewed in reflexion by saying that they always have a "going from us" aspect.

But as we have already noted, we do experience emphatically very frequently a form in presentations which we commonly describe as giving to them this "going from us" aspect, *viz.*, the temporal form which leads us to speak of the presentation in connexion with which it appears as related to the past.

It would thus appear that the temporal form which we designate as pastness is one given as, or in indissoluble relation with, the simplification of complexity in the whole complex presentation of reflexion.

It would appear also that while this characteristic of simplification of complexity, which we recognise as pastness, is given in connexion with all of our presentations within consciousness as viewed in reflexion, nevertheless it is given more emphatically in connexion with presentations which involve the distinct recognition of pastness. The characteristic which when emphatic we speak of as the going from us aspect,—the pastness quality,—of presentations is in fact of the very essence of the nature of all complex presentations given in reflexion; and it is this fact that leads us to refer to the presentative field in general in spatial terms as a stream ever flowing from us.

We are thus able also to account for the important fact which we describe also in spatial terms when we say that the time series has a movement in one irreversible direction; a fact which we have seen must be taken account of in any adequate explanation of the nature of the time quality. For evidently if all reflexion upon successive presentations involves an appreciation of a simplification of complexity of successive presentations, then when our thought is turned to this aspect of presentations it must be recognised as describable in terms of a stream ever flowing in a given direction, the perception of such a stream necessarily involving an emphasis of this simplification of complexity within the given presentations.

Sec. 17. We thus see clearly also the ground in experience for the distinction between the "now" and the "specious present" of which we have above spoken.

As all presentations as viewed in reflexion involve a simplification of complexity as indicated in our typical formula 3 above, so must that special type of presentation which is conceived of as existing in the present moment, the nature of which we shall presently consider. In contrast with those presentations in which this simplifying complexity is much emphasised, in which therefore marked pastness is displayed, this so-called present stands out as unique, and is spoken of as the "present". But careful observation shows us the existence of this moving from us aspect even in connexion with such presentations, and under close scrutiny we find the present of reflexion in reality qualified with pastness as all other reflective presentations are, and see that it is in reality a "just gone," and is not the *now* but a "specious present".

Sec. 18. Those of my readers who have followed my thought in the article on "Presentation and Representation" above referred to, will also now see clearly why it is that what we usually speak of as "representations" must always display an emphasis of this general quality of all presentations, and must always be distinctly pervaded by the pastness phase of the time quality.

B.

Sec. 19. As we have just seen, on top of this ever-moving stream of consciousness, in which pastness is always given, there may appear many minor psychic emphases or minor presentations in various relations; and when these happen to take the form which is emphatically given when distinct objects in space are becoming separated from us this sense of pastness is very marked.

But these psychic emphases in their relations may also happen to take a form which is markedly given when distinct objects in space are moving towards us, or we towards them; and then we would be likely to describe this form as involving a "coming to us" aspect.

In such cases the presentations of three successive moments may be symbolised as per the formulæ below; for it must be assumed that with the approach of an object to us new forms of partial stimulation become effective to produce new partial psychic emphases in the complex presentation of the moment.

$$(5) \{ {}^a p^{1-2-3^{245} \times 6} \}.$$

$$(6) \{ {}^s p^{1-2-3^{245} \times 6 \times 7} \}; {}^a p^{1-2-3^{245}}.$$

$$(7) \{ {}^r p^{1-2-3^{245} \times 6 \times 7 + 8} \}; {}^s p^{1-2-3^{245} \times 6}; {}^a p^{1-2-3^4}.$$

Here the newly-accruing psychic emphases are indicated by the addition of $\times 7$ in (6), and of $\times 7$ and $+8$ in (7).

These formulæ (5, 6, 7) may then be taken to represent the emphatic form involved in the presentations of reflexion whenever we perceive objects approaching us; and this may be described as the "coming to us" aspect of the perceptual presentation. But as we have already noted we find that we always attribute this "coming to us" aspect to the temporal phase of presentations which we describe as their futureness; and we may therefore assume that futureness is determined by the existence of this form in the presentation whether it is perceptual or not.

If then we reflect upon this state (7) as a whole (if we put this in a form related to the serial arrangement of the occurrence) we have,

$$(8) {}^a p^{1-2-3}, \text{ plus } {}^s p^{1-2-3^{245}}, \text{ plus } {}^r p^{1-2-3^{245} \times 6 \times 7}, \text{ plus } \left\{ \begin{array}{l} \text{the "sense of relation" de-} \\ \text{termined by the nature,} \\ \text{of the three partial em-} \\ \text{phases } {}^a p, {}^s p, {}^r p. \end{array} \right.$$

The formula (8) then, as a whole, may be taken to represent presentations in which the coming to us time phase, i.e. futureness, is emphatic.

But if we examine this formula (8) we note that it involves in a marked form a developing complexity.

This becomes clear by placing the comparable parts of the formula (4a) and (8) in conjunction.

(4a) Simplification of Complexity:—

$${}^a p^{1-2-3}, \text{ plus } {}^s p^{1-2}, \text{ plus } {}^r p^{1-2} \text{—Pastness.}$$

(8) Development of Complexity:—

$${}^a p^{1-2-3}, \text{ plus } {}^s p^{1-2-3^{245}}; \text{ plus } {}^r p^{1-2-3^{245} \times 6 \times 7} \text{—Futureness.}$$

It would thus appear that the temporal form which we designate as futureness is one given in, or in indissoluble relation with, the development of complexity in the whole complex presentation of reflexion.

This seems the more probable because the temporal phase which we speak of as futureness has a characteristic which

has been aptly described by Dr. James as "budding". But a still stronger corroboration of this view is given in the fact that futureness is always thought of as diametrically opposed to pastness; and as we have seen above the pastness temporal phase seems to be related to a simplification of complexity, which is diametrically opposed to the development of complexity which we here suggest as the form to which our appreciation of futureness is due.

C.

Sec. 20. We have thus attempted to explain the appreciation of pastness and of futureness as being due to a recognition respectively of the simplification and of the development of complexity in successive presentations. If this explanation is in any respect adequate, it is easy to see that a special quality will be given to any presentations in which both the marked simplification and the marked development of complexity are lacking, and in which a relatively unchanging complexity is maintained. Inasmuch as all presentations of necessity involve forms displaying simplification of complexity, an appearance of unchanging complexity can only be given by artificial means, so to speak, such as are given by continuous emphatic stimulations reaching us in connexion with unchanging objects in fixed spatial relation with our bodies.

Now just such conditions give us our appreciation of emphatic presentness in connexion with emphatic perceptual experiences of outer world objects, and lead us to describe the presentness qualification of our presentations as the "now-here" aspect. Our experience of these presentations therefore accords well with our theory.

As we have already seen, all presentations as viewed in reflexion are really qualified by a measure of pastness due to the fact that the very nature of all such presentations involves simplification of complexity which carries with it this pastness qualification: and this is true then even of those presentations which are emphatically qualified by presentness. It is thus clear how it happens that in viewing presentations as a whole we note that the presentations displaying presentness—i.e. what we call the present—are in reality just gone in relation to the "now" of experience,—how it happens that we come to see that this present is not what we mean when we speak of the "now," but what Clay has called a "specious present".

Sec. 21. In the complex presentations of any moment of

reflexion there must always exist a present, this as we have seen being for the most part determined by the momentarily existing environmental stimulations. This ever existing presentness serves as a *norm* with which we compare the time quality of any particular partial psychic emphasis within the whole complex emphasis which gives character to the noetic pattern of the moment. As Bradley¹ well says: "We are aware of and think of the past as past always by an ideal construction from the present, and the immediate presentation of the past as such would be a gratuitous miracle". The same may be said of our conception of the future.

The general time quality as viewed in the presentations of reflexion must always show the passing away or pastness phase, which must appear as such in contrast with this "specious present" of the moment's unchanging complexity; for apart from the existence of such a present of relatively unchanging complexity we could not apprehend by comparison the cessations which pastness involves—the simplification of the complexity in parts of the complex presentation.

But in connexion with all of our complex presentations there is always also some measure of "budding"—of future-ness. This future-ness when apprehended also appears as such in contrast with the "specious present" of the moment's unchanging complexity; for again apart from the existence of such a present of relatively unchanging complexity we could not apprehend by comparison the "budding," which future-ness involves—the development of the complexity in parts of the complex presentation.

But if this is true it is also true, on the other hand, that this presentness itself appears as such only by contrast. As James Ward well says:² "The present alone, and life as a succession of presents, or, in other words, continuous occupation with impressions, give us no knowledge of the present as present. This we first obtain when our present consciousness consists partly of memories or partly of expectations (states in which pastness or future-ness respectively are pre-eminent, H. R. M.) as well."

Sec. 22. This "specious present" is thus as it were a mere place of transition in the stream, where the future-ness phase passes over into the pastness phase, where the complexity appears as neither developing nor simplifying. It is true that this "specious present" is never clearly apprehended as a *line* of transition; and so it is true, as Prof. James says, that we apprehend the "present" not as a knife

¹ MIND, N.S., 30, p. 152.

² Enc. Brit., Art., p. 64.

edge but rather as a saddle-back with "fringes"—i.e. not clearly apprehended parts—spreading out on the one hand into the futureness and on the other hand into the pastness.

This is especially interesting as it shows the close relations between the algedonic and the time qualities, in the fact that the algedonic *norm*, viz. indifference, like the temporal norm, viz. presentness, displays this more or less of indefiniteness, so that indifference too may be described better as a saddle-back than as a knife edge, much that we speak of as indifference being tinged with what we may also call a pleasure fringe and a pain fringe.

VI.

Sec. 23. From our study in the preceding division it would appear that the recognition of the time phases is due to the relative complexity of successive presentations as this is appreciated in a complex presentation of reflexion which embodies the relation between these successive presentations. Or if this seems to be going too far it may at least be well claimed that these time phases are determined by some characteristic of such reflective presentations which varies to all intents and purposes directly with variations of this complexity.

If this is the case then certainly the time phases must be phases of a general quality of all presentations determined in nature by the complexity of psychic emphases; and it will be worth our while in closing to pass in review the characteristics of these temporal phases in order to see how far it is possible to account for them under this psychological hypothesis.

Sec. 24. The Time Quality then appears to be a general quality of all presentations as viewed in reflexion,¹ and of a three-phased nature, one phase of which must, any one of which under proper conditions may, and no two of which may at the same time, be emphatic in connexion with any special psychic emphasis or presentation. That is each specific presentation must display either marked pastness, or presentness, or futureness; and under the proper conditions it may display either of the three; but if it displays a marked pastness it cannot in itself display marked presentness or futureness, if it displays a marked presentness it cannot in itself display marked pastness or futureness, and if it displays a marked futureness it cannot in itself display marked pastness or presentness.

¹ Cf. Münsterberg, *Grundzüge d. Psychologie*, pp. 320-330; whose argument implicitly involves the position here maintained.

Sec. 25. In order to avoid misconstruction of the above statement it must at once be noted that we have thus spoken of specific presentations. But as we have said, our presentations may well be described as psychic emphases, and in ordinary experience these psychic emphases display complexes of minor emphases within the major emphasis; our field of presentation taken as a whole is a complex of more or less clearly differentiated minor presentational parts, each of which so far as differentiable has its specific character. Hence we might expect when we consider experience as a whole in reflexion to find that it always displays some pastness, some presentness, some futureness; one of the three phases being usually more emphatic than the others as one of the partial presentations in the whole complex is more emphatic than the others.

It is this experience which leads us, as we have seen, to describe experience as a whole as a "stream," in part ever flowing toward us, in part being with us, in part ever flowing away from us: a stream which appears constantly to leap over a brink from which it approaches us, and as constantly to pass us by, and to flow away like a river across a broad plain. At each moment the broad field of presentations has in it something of futureness (*i.e.* some parts in which there is a relative development of complexity); something of presentness (*i.e.* some parts in which there is a relatively stationary complexity); and something of pastness (*i.e.* some parts in which there is a relative simplification of complexity).

Sec. 26. At the same time we can scarcely expect to find any moment of experience in which one of the three phases, either the pastness, or the presentness, or the futureness, is not markedly predominant.

A. When the most emphatic part of the noetic pattern under consideration displays marked futureness we speak of the whole presentation as relating to the future, although in it as a whole exists something of presentness and of pastness. When, for instance, I think of the next President of the United States, in the presentation as a whole there is an emphasis of futureness; and yet there is not lost a sense of presentness, not only in the fact of the appearance of a new partial emphasis arising in correspondence with the moment's environmental stimuli, but also in the fact that there exists dimly the minor partial presentation "a President now existing"; nor is there lost a sense of pastness, in the vague cognisance of the nature of Presidents as they have existed for over 100 years. In such a case, however, this presentness and pastness are all in the background, and we think of our

next President as in the future; the presentation or psychic emphasis as a whole has futureness.

B. When the most marked part of the noetic pattern under consideration is that part which displays marked presentness we speak of the whole presentation as "the present". And in the vastly large proportion of the moments of life this is the experience which is emphatic; and this because the influences of environmental stimuli are so usually forceful and persistent. The page which you now read has this presentness for you; but within the complex presentation of this moment a minor emphasis of what you have just read is passing away, as we say in our spatial terms; i.e. this minor emphasis has the quality of pastness, it is fading off into what Dr. James calls the "backward fringe". At the same time the end of the sentence that I am beginning, the bottom of the page you are approaching, are "budding" as minor presentations, as minor emphases within the whole noetic pattern of the moment; and so far as they are presented at all they have the quality of futureness; this is what Dr. James calls the "forward fringe".

C. When the most marked part of the noetic pattern under consideration is that part which displays marked pastness we speak of the whole presentation as relating to the past. When you think of the first words of this chapter pastness is emphasised; nevertheless you cannot rid yourself of the less emphasised "presentness" of the minor presentations corresponding with the moment's effects of environmental stimuli; nor can you rid yourself of the more or less dim futureness, or "budding," which goes with each moment of existence.

Sec. 27. While there is thus something of pastness, and of presentness, and of futureness, in connexion with all presentations; nevertheless, as we have already said, a marked degree of emphasis of one of the three phases of the time quality in connexion with a definite emphatic minor presentation precludes the emphasis of the other phases. The thought of my grandmother is so distinctly of the past that the presentness and futureness of the total complex presentation of the moment disappear by comparison. The pressure on my tired hand as I write is so distinctly of the present that the pastness and futureness of the total complex presentation disappear by comparison. The thought of our next President is so distinctly of the future that the presentness and the pastness of the total complex presentation disappear by comparison.

Sec. 28. It is equally clear that if conditions are favourable

we may experience any one of these three time phases emphatically in connexion with any given presentation. If as I write I think of Roosevelt, I may think of Roosevelt as Vice-President, and then the presentation is one in connexion with which pastness is predominant; but if I think of Roosevelt as President the presentation is one in connexion with which presentness is predominant; while if I think of Roosevelt as our possible next President the presentation is one in connexion with which future-ness is predominant.

Sec. 29. While it is true in general that where a presentation is distinctly qualified by one temporal phase the existence of the other two temporal phases in connexion with it is overlooked; nevertheless our presentations are so complex that they are often more or less clearly separated into minor psychic systems, and thus we not infrequently find various phases of the time quality sufficiently marked to be noted at one and the same time in connexion with slight changes in the nature of a given presentation.

A presentation of practically the same nature may be noted in reflexion as belonging in the past, the present, and the future. For example, we may note our conception of the processes of evolution in the physical world, which we conceive of as *having governed* in the past, and as *being exhibited* in the present, and as *to continue* in the future.

We may note a similar presentation as in the past, and in the present, to the exclusion of the future: as for example when we revisit some haunt of our childhood which we realise we cannot again see in the course of our lives.

We may note a similar presentation as in the present and in the future, to the exclusion of the past; as when one receives an increase of income through the unexpected increase of his salary.

We may note a similar presentation as in the past and in the future to the exclusion of the present; as when, engaged in business, one thinks of his games of golf as played yesterday and to be played to-morrow.

Sec. 30. In certain cases a given presentation of the past, when viewed in the reflective presentation of the moment, may have a characteristic pastness quite apart from the mere pastness involved in the time flow of the moment: this being due to its firm connexion with all that vast field of secondary presentations that are bound by indissoluble bonds to those secondary presentations in which the past-time form is emphasised. I have, for instance, the presentation "my great-great-grandfather". This man is thought of as in the past without any question: yet I have had no experience

of that great-great-grandfather to account for the pastness of the presentation similar to that which enables us to account for the pastness of an event of yesterday, or of last week, which we describe as being due to the holding in mind of a train of secondary presentations, in which if we hold to our special view we can see that decreasing complexity must be a marked characteristic.

It is easy to see that a vast field of secondary presentations must necessarily be attached by inherent bonds to the lately experienced past. This vast field so far as its time quality is emphasised in attention becomes for us *the Past* as a special presentation. Whenever any secondary presentation due to a thought process which is only indirectly the result of experience is found to be indissolubly attached to this vast field which we call *the Past*, then although it may not have in itself the emphatic marks of pastness it nevertheless is identified with *the Past*. The truth of this view becomes clear when we consider the case just referred to. The idea of my father is distinctly part of the experience of my life in which the quality of pastness is emphatic: the idea of my grandfather who died in my childhood is only to a very small degree part of that experience; but the idea of my great-great-grandfather, while having in itself no other pastness than that inherent in the time flow of the momentary presentation, gains its distinct pastness by its inherent attachment to the body of experience in which the quality of pastness is emphasised in reflective attention.

In fact if we note our experience with care we find that an indefinitely small part of the presentations which we call past have anything more to warrant this qualification than this attachment to the inextricably complex web which spreads away from those late experiences, which give us the presentations of the *late past*, in which the form of pastness is emphasised. Even the thought of my father, who died not so many years ago, is I find in no small part merely past in the same sense in which the thought of his great-grandfather is.

Sec. 31. In a similar manner a given presentation, when viewed in the reflective presentation of the moment, may have a characteristic futureness quite apart from the mere futureness involved in the time flow of the moment: this being due to its firm connexion with all of the field of secondary presentations which are bound by indissoluble bonds with those secondary presentations in which the future-time form is emphasised. I think, for instance, of my grandchildren as in the future, and here the development

of the presentation which relates to what is entirely within the possibilities of experience gives without doubt an inherent futureness to the presentation. But when I think of my great-great-grandchildren I think of them equally as distinctly in future time: yet no possible experience to be mine can account for the distinct futureness of this presentation.

It is clear indeed, in a manner similar to that noted in relation to pastness, that a broad field of secondary presentations must attach to the field in which true futureness is emphasised. This field so far as its time quality is emphasised in attention becomes for us *the Future*, as a special presentation.

Whenever any idea is found to be indissolubly attached to this field which we call *the Future*, then, although it may not have in itself the emphatic marks of futureness, it nevertheless is identified with *the Future*. The idea of my grandchildren certainly has some considerable amount of futureness inherently attached to it: but the idea of my great-great-grandchildren can have but little of this inherent futureness, although it is distinctly placed in *the Future*, and that by the process above described. It gains its distinct futureness by its attachment to the body of experience in which the quality of futureness is emphasised in reflective attention. In fact, only an indefinitely small part of the presentations which we think of as in the future have anything more to warrant this qualification than this attachment to the inextricably complex web which is connected with those experiences in which futureness is distinctly emphasised.

Sec. 32. As we have seen, when a presentness is noted it stands always in relation to a futureness or a pastness. In case of such a relation we say "this is a not past," or "this is a not future," "it is the actual present". And here we have no possibility of the attainment of the quality in question by any such indirect process of attachment as is observable with pastness and futureness. The Past is a stream of indefinite dimensions: the Future appears also as a stream, although its extent is less than that of the Past. The Present (the "specious present"), however, is but the cross section of this stream, and as such stands in distinct contrast in this respect with the Past and with the Future.

Sec. 33. It seems clear from what has preceded this, that under our hypothesis the whole presentation of each moment is a complex of multiple emphases, this being involved with the fact that human consciousness is a highly complex system of psychic systems; and that the form of the presen-

tations within consciousness is determined by the reverberant nature of the coincident activities of complex neural systems, in connexion with the processes which we speak of as physical and psychic assimilation.

I have sought in this article to show that under these conditions these factors, which are always implicated in each moment of consciousness, themselves involve the experience of the time flow; and that this must appear either as pastness, or futureness, or as a somewhat which is a transition between the two, which we call presentness.

Even if it is shown that the suggested relation of the time phases to presentational complexity is unwarranted, nevertheless I think the facts brought out in the course of our investigation have shown conclusively that Timeness is a general quality of all presentations, of a three-phased nature; that in reflexion at least one of these three phases (pastness, presentness, or futureness) must usually be predominant; and that if any one of these three phases becomes predominant as a qualification of any given presentation, this fact necessarily excludes the prominence of either of the other two in connexion with the same presentation.