has been kept up assiduously, and in recent years the number of meridian observations of the Moon has largely surpassed those made anywhere else.

In spite of this limitation in the scope of its operations, the Naval Observatory has not been unmindful of other lines of work. As instances of this may be cited the brilliant discovery of the moons of Mars by Professor Hall; the extensive work upon the satellites of the outer planets by Professors Hall, Newcomb and Brown; and finally the star catalogues of Professors Yarnall and Eastman and the contribution to the great star catalogue of the German Astronomical Society in the observation of the zone of stars from 13° 50′ to 18° 10′ of south declinations.

A. N. Skinner.
U. S. Naval Observatory.

THE PSYCHOLOGY OF SOCIETY.

The attempt to construct a science of society by means of biological analogies has been abandoned by all serious investigators of social phenomena. It was one of those misdirected efforts that must be looked upon as inevitable in the development of any branch of knowledge. The notion of a universal evolution compelled those who accepted it to try to find some other explanation of our social relations than that dogma of an original covenant which had come down to us from Hobbes and Locke. Biology supplied most of the facts and ideas of which the evolutionary thought was constructed; and naturally, therefore, biological conceptions were first made use of in formal Sociology. At present, however, all serious work in Sociology starts from psychological data, and proceeds by a combination of psychological with statistical and historical methods.

Psychology has had a development somewhat similar. Beginning with purely metaphysical terms and reasonings, it became a natural science with the advent of evolutionary thought, and for a long time drew its best materials and its most fruitful hypotheses from physiological data. Physiological Psychology was the only psychology very well worth attention. George Henry Lewes was one of the first writers to argue, as he did with great force and brilliancy in the 'Problems of Life and Mind,' that the physiological explanations of mind must be supplemented by explanations drawn from the study of society. At the present time the social interpretation of mental development is an important part of psychological activity.

Psychological and sociological investigations have thus converged upon certain common problems, namely: The problem of the social nature of the individual mind, and the problem of the psychical nature of social relations. Any new contribution to either Psychology or Sociology is likely to be found also a contribution to the other, and we may look in the near future for a number of books of which it will be difficult to say whether they are primarily works on Psychology or on Sociology.

This is eminently true of Professor Baldwin's 'Social and Ethical Interpretations,' the second volume of his work on 'Mental Development.' The first volume, on 'Methods and Processes,' was definitely a study in Psychology. The problem dealt with was that of mental development through the interaction of physical and social causes, and the importance of social factors was emphasized throughout. In the volume on 'Social and Ethical Interpretations' we again find the same problem. The development of the individual mind through its social relations and activities is further considered. In this volume, however, the opposite problem also is introduced. The development of social relations and activities through the outgoing of the individual is discussed, and the nature of society is subjected to a critical examination.

A division of the volume into two books corresponds to the above distinction of the problems dealt with. Book I. is a study of the person, public and private; Book II. is a study of society. The four formal parts of Book I. deal respectively with the imitative person, the inventive person, the person's equipment and the person's sanctions. The three formal parts of Book II. deal respectively with the person in action, social organization and practical conclusions.

I shall not attempt in the present article to review Professor Baldwin's treatment of all these subjects, or even to summarize his conclusions. I shall examine only the two conceptions that are of chief interest to the sociologist. These, of course, are the conception of the social nature of the self, or individual personality, and the conception of the psychic nature of society.

Psychology, some time ago, got beyond the conundrum

> "Should I be I or should I be
> One-tenth another and nine-tenths me"

if my great-grandmother had married another suitor? It seems to be agreed on all hands that in any case the ego is nine-tenths or more somebody else. That is to say, his individual personality is for the most part a product of his intercourse with other personalities. Professor Baldwin, as readers of his earlier works are aware, goes even beyond writers like Ribot and James in his account of the composite origin of the self. He holds that not only does the self incorporate elements from other personalities, so that, at any given time, it includes thoughts and feelings derived from others, and acts in imitation of the conduct of others, but also that its very thought of itself is merely one pole of a consciousness 'of a sense of personality generally,' the other pole of which is the thought of some other person or *alter*.

This comprehensive sense of personality at first is merely projective—to use Professor Baldwin's term; it is a mass of more or less vague impressions received from persons who are encountered and observed. It is secondly subjective; the ego, by its imitations of observed persons, incorporates their peculiarities to some extent in itself. It is thirdly ejective; the self interprets observed persons in terms of its own feelings, thoughts and habits. This give and take between the individual and his fellows Professor Baldwin calls 'the dialectic of personal growth;' and he says it may be read thus: "My thought of self is in the main, as to its character as a personal self, filled up with my thought of others, distributed variously as individuals; and my thought of others, as persons, is mainly filled up with myself. In other words, but for certain minor distinctions in the filling, and for certain compelling distinctions between that which is immediate and that which is objective, the ego and the alter are to our thought one and the same thing." Thus the individual is always a socius, and not merely because, after reaching adult life, the necessity of cooperating with his fellow-men compels him to adapt himself to them and to modify an original egoism by the cultivation of social habits, but because, from his earliest infancy, his own development as a self-conscious person has been incorporating social elements and creating within himself a social no less than an individual point of view.

When adult life is reached, however, the process does not cease. The dialectic of personal growth continues to determine all our thinking, our social no less than our individual judgments; that is to say, in arriving at any judgment, we incorporate in our thought the judgments of other men; and we interpret the judgments of other men by our own.

It follows that all of those social relations and policies which are products of

reflection no less than of feeling are determined by the 'dialectic of personal growth,' and that, like judgments of things in general, they are, in the thought of individuals, highly composite products of subjective and ejective views of the same phenomena.

Approaching the study of society in this way, Professor Baldwin is naturally led to discriminate between the substance, content, stuff, or material of society, and the functional method or process of organization of the social material. He criticises the sociologists for not having definitely enough discriminated these two problems. Consistently with his conception of our social judgments, he describes the matter of social organization as follows: "The matter of social organization consists of thoughts; by which is meant all sorts of intellectual states, such as imagination, knowledges and informations." This 'matter,' he thinks, is found only in human groups, which only, therefore, can be called societies. Animal communities he would call 'companies.' The functional method or process of organization of the social material he is satisfied to find in the process of imitation as subjectively contained in the 'dialectic of personal growth,' and objectively described, in sociological terms, by M. Tarde. Social evolution results from the interaction of the individual as a particularizing force and society as a generalizing force. All solidarity and conservation are due to the generalizing force; all variation to the particularizing force. Progress is a dialectic of give and take between these two elements.

In examining these conceptions I shall admit their general or substantial truth, and inquire only whether they need modification, limitation or expansion. Do they sufficiently and precisely express the whole truth and nothing but the truth?

Is the thought of self quite so largely a product of the social relation as Professor Baldwin represents? Is it accurate to say that "my thought of self is, in the main, filled up with my thought of others," even if we admit 'minor distinctions in the filling' and "certain compelling distinctions between that which is immediate and that which is objective?" What are these compelling distinctions of the immediate? Obviously, they are those presentations in consciousness which arise from organic conditions rather than from social relations. Hunger is a state of consciousness which can subvert the entire product of the 'dialectic of personal growth;' and the sociologist is unable to lose sight of the fact that when men who have been developed by that dialectic into socii are confronted by starvation they are liable to have thoughts of self which can hardly be construed as filled up mainly with thoughts of others, unless he is prepared to accept a cannibal's definition of others. The sociologist, then, must continue to think of the individual as being both an ego and a socius, and yet as being at all times more ego than socius.

The importance of this modification of Professor Baldwin's formula is chiefly for purposes of economic theory. No economist will be able to accept Professor Baldwin's contention (bottom of page 13) that it is illegitimate to 'endeavor to reach a theory of value based on a calculus of the desire of one individual to gratify his individual wants, multiplied into the number of such individuals.' The truth is that, for most purposes of economic theory, this procedure is not only legitimate, but is the only one psychologically possible. The compelling wants that political economy has chiefly to consider are those which arise from the organic nature and which, therefore, magnify the ego at the expense of the socius.

The modification is necessary also for purposes of ethical theory. Professor Bald-

win, if I rightly understand him, derives all ethical phenomena from social relations. This I believe to be an error. Economic motives are specific cravings of particular organs or groups of organs. Complete satisfaction of economic wants may deprive other organs of their due satisfaction. The protest of the neglected organs and the hunger of the entire organism for integral satisfaction is, I believe, the original source of all ethical motive, which, therefore, is indefinitely developed by, but not initiated in, the 'dialectic of personal growth.' *

It seems probable, then, that in 'the dialectic of personal growth,' the original ego with which the dialectic starts, plays throughout a controlling part; and that, after all, the process of developing a socius is one which consists essentially in modifying, by means of social relations and activities, an originally independent self.

The modification, however, is undoubtedly produced by the process of give and take between ego and alter. The question, then, that I wish next to raise is: Is the give and take, in which the ego engages, carried on indiscriminately with any alter, or is there, from the very beginning of conscious life, a tendency to discriminate between one and another alter, and to limit the conditions of personal growth by that state of consciousness which may be described as a consciousness of similars or of kind? Scattered throughout Professor Baldwin's writings are many intimations that he has suspected, or perhaps even been definitely aware of, such limitations. I do not find, however, that he has anywhere endeavored to formulate them or to bring them systematically within the formulas of his dialectic.

What, then, are some of the inquiries which should be made in regard to these limitations?

* I have considered this subject at greater length in an article on 'The Ethical Motive,' in the *International Journal of Ethics*, April, 1898.

First, I think that we should inquire whether, long before any discriminations of kind have become possible, a preparation for them and a tendency toward them is made in conscious experience. Of the sensations which first arise in consciousness some are received from the bodily organism which the self inhabits; some are received from similar bodily organisms, and some are received from wholly unlike objects in the external world. Now, we know that many sensations received from self are so nearly like sensations received from likeselves that, merely as sensations, they can be distinguished only with difficulty. If, for example, I strike with my voice a certain note of the musical scale, and another person a moment after strikes the same note with his voice, my auditory sensations in the two cases will be very nearly alike. If I cry out in pain, and then hear another man like myself cry out in pain, my auditory sensations will be nearly alike. If, however, I hear a dog bark the sensation will be different from that which I have received from my own voice. If I walk with my friend down the street, and happen to notice the motion of my feet as I take successive steps, and then to notice the motion of my friend's feet, the visual sensations will, in these two cases, be closely alike. If, however, I happen to notice the trotting of a horse that is being driven by me the visual sensation will be different from that which I have received in observing my own steps. If I stroke the back of my hand, and then stroke the back of my friend's hand, I shall receive tactual sensations that are closely alike. If, then, I stroke the fur of a cat or the mane of a horse, or touch the paw of a cat or the hoof of a horse, I shall receive sensations very different from those received from the back of my hand. It appears, then, that before there is any power to make discriminations of any kind, even to think of differences of sensation, sensa-

tions themselves fall into different groupings. At the very beginning of conscious life certain elements which are to enter into a consciousness of kind begin to appear in experience. They consist of like sensations received from self and from others who resemble self.

On the basis of these experiences there are developed others that call for investigation from the same point of view. When suggestion begins to play an important part in mental life are suggestions from persons very unlike self equally efficacious with suggestions from persons nearly like self? There is here a great field for investigation. A thousand familiar observations strongly indicate the superiority of suggestions that come from those whose neural organization resembles that of the person affected. Why, for example, does Maudsley venture to say, without offering the slightest proof, that, while men are as liable as silly sheep to fall into panic when they see panic among their fellows, they are not similarly liable when they perceive panic among sheep? Obviously, because facts of this general character are so familiar that no one would think of questioning them. In like manner, a child who objects to performing a certain task which his father asks him to do will do it without hesitation if he sees other boys in the street engaged in the same work. Phenomena like these, of course, have their origin in a like responsiveness of like organisms to the same stimulus.

A third class of experiences and activities, which are ultimately to enter into a consciousness of kind, and that are already very probably dominating 'the dialectic of personal growth,' are imitations. Here, also, there is room for exact investigation; but we may predict at the outset that investigation will verify the common opinion that we chiefly imitate our similars. The equally familiar fact that we do not always do so is of immense importance for the theory of variation, invention and originality. And this theory, I believe, is not to be constructed without referring back to the truth mentioned above, that the ego is at all times the original and dominant element in the 'dialectic of personal growth.' I am not at present prepared to give my reasons, but I expect that it will be shown that in the same reaction of the organism upon the organ which is the source of ethical motive will be found the source of originality, variation and the occasional imitation of those who differ from, rather than resemble, ourselves.

The factors thus far considered, namely, like responsiveness of like organisms to the same stimulus, like sensations received from self and from others who resemble self, a greater responsiveness to suggestions from like selves than from not-like selves, and a greater readiness to imitate like selves than to imitate not-like selves, together make up the organic sympathy that is a bond of union in those groups of animals that Professor Baldwin calls companies, and the bond of union of men who act together impulsively rather than reflectively—the bond, in short, of the mob. It is certain that organic sympathy depends on organic likeness, and the phenomena that have been named above are the psychological correlatives of organic likeness.

How is organic sympathy converted into a higher or reflective sympathy? The true answer, I think, is: Through the mediation of that perception of resemblance which is the initial stage in the conversion of a mere sensational experience or likeness into a reflective consciousness of kind. When the power to perceive relations and to make discriminations arises, the perception of resemblances and differences among one's fellow-beings becomes an all-important factor in the further development of social relations and in the 'dialectic of personal growth.' From that moment organic sym-

pathy becomes a function of the perception of resemblance; and sympathy becomes, to a certain extent, reflective. Even in mob action the reaction of the perception of kind may be seen with the utmost clearness. When, for example, a mass of men simultaneously respond to a party cry or symbol the action for the moment is merely a like responsiveness to the same stimulus. An instant later, when each man perceives that his fellow-beings are, in this respect, resembling himself in feeling and in action, his own emotion is enormously intensified. It is this which gives to all symbols and shibboleths their tremendous social importance. The phenomenon has been very well described in the concluding pages of Dr. Boris Sidis's 'Psychology of Suggestion.'

Let us pass, now, to the conception of the psychical stuff or substance of society.

Professor Baldwin's thesis, as we have seen, is that "the matter of social organization consists of thoughts, all kinds of knowledges and informations." He thus places himself in definite opposition to those writers who have made sympathy, or any kind of emotion, the psychological stuff of society. It is for this reason that he makes a sharp distinction between animal 'companies' and human societies. Criticism of this thesis may be made from two points of view: one, the historical, supported by observations from animal communities; the other, the psychological, supported by those analyses of the relations of sympathy and perception which I have sketched above. From the standpoint of the observer of animal and primitive human societies it is difficult, if not impossible, to establish a line of demarcation between the more highly organized bands of animals, like troops of monkeys, or herds of elephants, or bands of wild horses, and the simplest hordes of human beings, like Bushmen or Australian Blackfellows. No one can say when, in the development of man from brute, sympathy ceased to be the chief stuff or substance of the social relationship, and thoughts in the form of inventions and knowledges began to assume that important place. In like manner, when modern human society is looked at from the psychological view-point, it is often, indeed usually, impossible to say whether sympathy or thought predominates in the intercerebral action of the associating individuals. Professor Baldwin's thesis would compel him to maintain that the same individuals are a 'society' one day and merely a 'company' another. At one time they are thoughtful and self-controlled; at another time they are an audience swept by emotion, or a mob given over to fury. Shall we, then, say that the stuff of society is thought merely, or feeling merely, or some combination of the two? Surely the last of these possibilities is the one that is most consistent both with evolutionary hypotheses and with psychological conclusions. The substance of society at first is sympathy and instinct mainly. At its best estate society may rise to a level where thought has for the moment completely subordinated feeling. But usually, and throughout the greater part of its career, society is sympathy and instinct more or less organized, more or less directed, more or less controlled, by thought. When the thought element appears society has become reflective, and a better way to mark the distinction between the lowest and the highest societies than that which restricts the word 'society' to the latter and calls the former 'companies' is one which indicates this element of reflection. Animal and primitive human communities are, for the most part, sympathetic or non-reflective societies; progressive human communities in general are reflective societies. The reflective stage corresponds to the appearance of the perception of kind and to reflective sympathy.

But even if we were to accept the thesis that the social stuff is exclusively intellectual we could not possibly admit that it

consists of all sorts of thoughts and knowledges indiscriminately. It undoubtedly includes all sorts of thoughts and knowledges, but not all sorts of thoughts and knowledges in and of themselves make society or the social stuff. The social stuff, so far as it is intellectual, is one kind of knowledge in particular, namely, knowledge of resemblances, knowledge of those modes of like-mindedness that make cooperation possible. The same logic that leads Professor Baldwin to try to separate the social stuff from other kinds of stuff should lead him further to distinguish the thought that is essentially social and capable of organizing all other thoughts and knowledges into social material from the thought and knowledge that have no such inherent power.

Perhaps, however, it is in his few remarks about the social process that Professor Baldwin has been most unjust to himself, and has missed an opportunity to make a really important contribution to social science. He is willing to grant that the social process consists in imitation. Yet, if the earlier chapters of 'Social and Ethical Interpretations' prove anything at all, they prove that imitations are progressively controlled, as individual development proceeds, by the process of ejective interpretation. To carry this thought into sociological interpretation it is necessary to bear in mind the function of resemblance, especially of mental and moral resemblance, in controlling relationships. In the ejective processes of the 'dialectic of personal growth' not all of our acquaintances are indiscriminately utilized. We detect the difference between those who, in ways important to ourselves, resemble us and those who, in ways important to ourselves, differ from us. Our ejective interpretations, therefore, are accompanied at every step by a process of ejective selection. These ejective selections are the psychological basis of all social groupings, not only of those of the more intimate sort, such as personal friendships, but those also of the purely utilitarian sort, like business partnerships. In a word, while imitation is a process that penetrates society through and through, it is not a distinctively social process. It is wider than the social process, just as thought is more comprehensive than the social stuff. The distinctive social process is an ejective interpretation and selection. In its widest form it includes imitation controlled by or made a function of ejective selection.

I may now very briefly indicate the further criticisms which, in pursuance of this thought, must be made upon Professor Baldwin's views—criticisms, namely, that apply to his treatment of social policy. No exception is to be taken to the analysis which describes the individual as the particularizing social force, and society in its entirety as the generalizing social force. But I fail to discover in Professor Baldwin's account of the subject any adequate recognition of the social causation of individuality. That causation must be sought in the phenoma of unlikeness in the social population. Throughout human history individuality and the possibility of social variation have been due to the commingling of ethnic elements, or, within the same nationality, to the commingling of elements long exposed to different local environments. The commingling itself is brought about by emigration and immigration. If the biological phenomenon of panmixia is all that Weismann, Galton and other investigators have represented to be, its levelling effects are counteracted and social progress is made possible only by continual groupings and regroupings in the population under the influence of ejective selection.

Finally, there is no possible explanation of social policy which leaves out of account the facts of mental and moral resemblance and the consciousness of kind. Without like-mindedness there can be neither spon-

taneous nor reflective cooperation. Not only must there be an agreement of thought, but for most, if not for all, public cooperation there must be a vast mass of sympathies and agreeing emotions. Men must have like sensations, be similarly sensitive to suggestion from resembling fellows, and enter subtly into like judgments without always being fully conscious of the process by which their conclusions are reached. The greater part of all public action must be described as a consequence of sympathetic and half-reflective agreement in plans and purposes, rather than as a consequence of systematic deliberation Moreover, it must not be forgotten that all public policy is a means to an end, proximate or ultimate; and that the ultimate end in every case is the maintenance and development of a certain type of man. That type itself is a mode of resemblance; and the recognition of it, which directs and controls all policies, is a mode of the consciousness of kind.

FRANKLIN H. GIDDINGS.

ATOMIC WEIGHTS.

THE following table of values is recommended for general adoption in analytical practice by a commission appointed by the German Chemical Society consisting of H. Landolt, W. Ostwald and K. Seubert. (Ber. d. D. Chem. Ges. *1898*, 31, 2761.)

The commission recommends that:

1. The atomic weight of oxygen be taken as 16.000, and that the atomic weights of the other elements be calculated on the basis of their combining ratios with oxygen, directly or indirectly determined.

2. The following atomic weights of the elements be adopted in practice, as they are probably the most correct values known at the present time.

These numbers are, as a rule, given only with so many decimals that even the last one may be regarded as accurate. In consequence, the atomic weights determined by Stas, in which the errors amount to from 3 to 6 units in the third decimal, are given with two decimals; the other atomic weights which have been more accurately determined are given with one decimal, and those less accurately determined are given without decimals. Exceptions to this rule have been made only in the cases of nickel, bismuth and tin, marked with an asterisk in the table.

Name.	Symbol.	Atomic Weight.	Name.	Symbol.	Atomic Weight.	Name.	Symbol.	Atomic Weight.
Aluminium	Al	27.1	Helium (?)	He	4.	Rubidium	Rb	85.4
Antimony	Sb	120.	Hydrogen	H	1.01	Ruthenium	Ru	101.7
Argon (?)	A	40.	Indium	In	114.	Samarium (?)	Sa	150.
Arsenic	As	75.	Iodine	I	126.85	Scandium	Sc	44.1
Barium	Ba	137.4	Iridium	Ir	193.0	Selenium	Se	79.1
Bismuth	Bi	208.5*	Iron	Fe	56.0	Silicon	Si	28.4
Boron	B	11.	Lanthanum	La	138.	Silver	Ag	107.93
Bromine	Br	79.96	Lead	Pb	206.9	Sodium	Na	23.05
Cadmium	Cd	112.	Lithium	Li	7.03	Strontium	Sr	87.6
Cæsium	Cs	133.	Magnesium	Mg	24.36	Sulphur	S	32.06
Calcium	Ca	40.	Manganese	Mn	55.0	Tantalum	Ta	183.
Carbon	C	12.00	Mercury	Hg	200.3	Tellurium	Te	127.
Cerium	Ce	140.	Molybdenum	Mo	96.0	Thallium	Tl	204.1
Chlorine	Cl	35.45	Neodymium (?)	Nd	144.	Thorium	Th	232.
Chromium	Cr	52.1	Nickel	Ni	58.7*	Tin	Sn	118.5*
Cobalt	Co	59.	Nitrogen	N	14.04	Titannium	Ti	48.1
Columbium	Cb	94.	Osmium	Os	191.	Tungsten	W	184.
Copper	Cu	63.6	Oxygen	O	16.00	Uranium	U	239.5
Erbium (?)	Er	166.	Palladium	Pd	106.	Vanadinum	V	51.2
Fluorine	F	19.	Phosphorus	P	31.0	Ytterbium	Yb	173.
Gallium	Ga	70.	Platinum	Pt	194.8	Yttrium	Y	89.
Germanium	Ge	72.	Potassium	K	39.15	Zinc	Zn	65.4
Glucinum	Gl	9.1	Præsodymium (?)	Pr	140.	Zirconium	Zr	90.6
Gold	Au	197.2	Rhodium	Rh	103.0			