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THE TECHNE

Life without Labor is a Crime, Labor without Art and the Amenities of Life is Brutality.—Ruskin

NOVEMBER-DECEMBER, 1927

MYSELF AND I

I want to live with myself and so
I want to be fit for myself to know—
I want to be able as the days go by
Always to look myself in the eye.
I don't want to stand, at the setting sun,
And hate myself for the things I've done.
I want to go out with head erect;
I want to deserve man's respect;
And here in the struggle for fame and pelf,
I want to be able to like myself.
I don't want to look at myself and know,
That I'm bluster, bluff, and empty show.
I can never hide myself from me;
I see what others may never see;
I know what others may never know.
I can never fool myself, and so,
Whatever happens, I want to be
Self-respecting and conscience free.

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The Techne publishes, for the most part, papers on educational subjects, though articles on closely related fields are also used. Part of these papers set forth the results of research; others aim at interpretation of current developments. Though some of the discussions will interest the specialist, it is hoped that in every number there will be something useful for the average teacher.

The Techne is sent free to alumni, teachers, school officials, libraries, and, on request, to any person interested in the progress of education.

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WHAT WE DID WITH MARIONETTES

Marjorie Dale Blatchley, Kansas State Teachers College of Pittsburg

"Temporary indisposition of doll actor delays puppet show," and "Charleston! Charleston!"—so ran some of the feature stories of our marionette shows in the daily papers of our city. The puppet shows have come to our community and school to stay.

There has recently been a movement throughout the schools of this section to make dolls of various types in the industrial arts classes of the grade schools. At our college, which is for the training of teachers specifically, the head of the art department is always alert to introduce new and up-to-date problems and projects. So after the marionette movement had no more than crossed the horizon, she gave it as a class problem to her students in art for the primary grades. The results were indeed amusing and unusual, but no less satisfactory for the lack of experience and a model with which to work.

Our first attempt at a show proved to be very fascinating. None of us students had ever manipulated a set of the dolls before, and the extremely funny antics of a miniature man in a tall silk hat and checkered trousers with a swallow-tail coat gave us the inspiration for the "Charleston" as a star feature of our vaudeville act. We had a funny "houn' dog" and a girl doll in a frilly dress besides our Charlestoner to work with. So we chose a little story from Hans Anderson's "Fairy Tales" entitled "The Snowman" and rewrote it, giving the maximum amount of action. The sun went down behind a miniature clump of pine trees and the moon rose in the same spot, the dog scratched his ear and the man Charlestoned while our small but appreciative audience squealed and laughed with excitement and wonder.

The first attempt having proved so successful, we decided to make a real show with a set of doll actors with character faces and a real stage with lighting facilities. For our dolls we took discarded brown silk and wool hose, and the dolls' trunk and legs down to the knees were cut in one piece. The trunk was stuffed to suit the proportion and weighted with an iron washer salvaged from the woodshed. The hip joint was then sewed flat in a diagonal seam to facilitate the movement of the doll and make natural action more readily attained. The legs were then stuffed and the calves and feet, which were cut in proportion and made as natural as possible and weighted with sand in little duck sacks, were sewed on with a flat seam to make the knee joint. For the arms we used much the same method, except that the hands were of cream cotton flannel and filled with sand and added with a flat seam at the wrist. The elbow was likewise jointed. The arm was then tacked to the shoulder (which had been shaped to slant slightly) in only one place so that it would pivot and allow all action possible.

So much, so good; but now for the heads, and intelligent faces. We thought if only we could make noses on the stocking-face dolls we should be happy! After discarding various unsuccessful methods we thought

of the paraffin that mother used to wax the irons with. We melted a little in a shallow pan and dipped a piece of white knitted material in it while it was still warm. When the stuff was nearly cool but still pliable, we stretched it over a china doll head which happened to be of the right proportion, and pressed it into all crevices rapidly as it was fast becoming cold and unworkable. When we had the desired effect we placed the head in cold water and slipped the wax shell from the form. Of course, as we did not want two faces alike, we emphasized the different features in each. When we had the required number made, we half filled the wax shells with plaster of paris, which held all features firm and prevented melting or breaking. The head of each was filled out with cotton and the back was a piece of cotton flannel, a good base for the hair of yarn, cotton, or the real article when it was available. We used a little of all three.

Then came the fun of painting the puppets. We used our oil paints. After putting on complexion color, we proceeded to make character lines on all but the heroine, with some amazing results. The hero turned out to be the villain, because of his black eyebrows and small mustache; and the smallest doll became, unmistakably, the little old woman with a haughty air and turned-up nose; while the one we named the king, upon being painted, was, without doubt, the court "fool!" Each doll was then dressed to suit his part. As we made our cast to fit an adaptation of "Robin Hood" and "Beauty and the Beast" together, we had to plan costumes that could be used for both plays. The brown material of which the bodies were made formed excellent tights for some of the costumes, while others had velvet trousers and coats. We went to mother's work basket for Lincoln green sateen and royal purple scraps, and among our old doll clothes found white kid pumps for our "Beauty."

Our cast being ready, we next thought of the stage. Friends constructed a collapsible frame structure in proportion with our twelve-inch dolls. It had a removable floor and a trough for tiny foot lights which had been used on our Christmas tree the year before. The wings were of beaver board and movable. We took heavy card board and nailed half rounds of dowel sticks to it and painted the exterior of the stage ivory. For the curtain we hung red-orange satinette on picture wire, top and bottom. This was worked from the back by tiny strings and tied at the sides during the performance.

Our reader sat in front with the audience; the stage being placed in a doorway and draped so that only the dolls were seen. She took cues from the lights and read the story as the lifelike creatures enacted the scenes. Of course we had appropriate music for "Charleston Charlie" and as one of our enthusiastic child observers said, "He even snapped his fingers."

When all was ready, we announced to the college and training school students that the show was open. We were scheduled to give three per-

formances but the audiences were so enthusiastic and taxed the capacity of the room to such an extent, that we gave ten programs and played to over four hundred people.

We are now planning for larger dolls and a better equipped stage, and hope that our experiences may be of value and give pleasure to other teachers interested in this line, for, may I repeat, the puppet offers a real problem in stage craft, costume and scenery design, and manual training, and it is here to stay.

THE ORIGIN OF BEHAVIORISM*

C. B. Pyle, Ph.D., Professor of Psychology and Educational Philosophy,

Systems of thought that flower out today send their roots deep into the soil of the past. The scientific theory of atom and electron was forecast by Democritus, and Pythagoras presaged the precise formulae which govern matter. To see in perspective is to see more truly. We view an organic development best from the roots upward. We shall understand behaviorism better by returning to its origin. Behaviorism of recent bloom began to germinate in the thought of Aristotle. Several distinguished writers representing various brands of behaviorism trace its lineage directly to the great thinkers of antiquity. Professor McDougall, who may be said to be the first that employed the term "behavior" with psychological precision, acknowledges his debt to Aristotle. Professor Singer, after a violent departure from well-trodden psychological paths, asserts in his discussion of the "Passive Thinker" that he is only trying to say what Aristotle said concerning the relation of mind and body. Professor Perry declares: "Behaviorism in a generalized sense is simply a return to the original Aristotelian view that mind and body are related as activity and organ. Expressed in more modern terms this means that the mental life consists of those performances of an organism that immediately involve the exercise of its nervous system."[1] Professor Holt, in his Freudian Wish, imagines that he is pursuing Aristotle's conception of the relation of "soul" and "body"; for he says, "If, now, the wishes are the soul, then we can understand in all literalness Aristotle's dictum, that the soul is the form of the natural body endowed with the capacity of life, soul is indeed the entelechy."[2] He comes to nominal agreement with Aristotle when he says, "Unquestionably the mind is somehow 'embodied' in the body. . . . In living human beings, certainly, the spirit is embodied." But Holt immediately abandons the high position of Aristotle, for he tones down "mind" and "spirit" until they have no part in shaping the action of the body. They

[1] "A Behavioristic View of Purpose," Journal of Philosophy, Volume XVIII, No. 4.

[2] Freudian Wish, p. 49.

are only like the "spirit of any piece of machinery," which "lies in what it can do." Holt begins with "capacity" as Aristotle did, but he fails to carry along with it the "energy" which precedes all "potentiality" and which is ultimately responsible for the development that leads "capacity" into "actuality." Mind evaporates into nervous stress, muscular tonicity, and bodily attitudes, aimed at a definite part of the environment.

Doubtless, with significant modifications, the behaviorists have carved their doctrines from Aristotelian "timber" and are at one with him in respect to development by an inner urge through natural causes and steadfast laws. Goal-striving, purpose, potentiality, development, and even despised teleology, which lie embedded in Aristotle's fundamental conceptions, become major considerations for the leaders of the new psychology. It is worth while to tarry long enough to see in brief perspective what of Aristotle has been carried forward, and what has been left behind because incompatible with present psychological and philosophical tendencies.

First, Aristotle's conception of development is woven into the fabric of behavioristic thought. The most significant portion of Aristotle's philosophy which has been revived in behaviorism is the theory of continuous progress from potentiality to actuality, from capacity to energy. The energy that lies back of all specific movement is God, whose essence is mind. This is the metaphysical side of Aristotle's great idealism. God is pure idea, and as final cause coaxes the world into realization by the pathway of allurement. Behaviorism rejects Aristotle's God as pure idea, yet accepts potentiality in the sense of physical potential energy, and actuality in the sense of kinetic energy set free by a stimulating environment. The behaviorists assume that matter is potent with future diversity and that the energy that drives capacity forward into realization is self-generative and called forth by specific situations. For Aristotle, form constructs matter while matter is recalcitrant. It lags behind and hinders form, giving rise to the defects of nature. Form is the shaping force of matter, which, as potentiality, finds its ground and justification in mental energy. For behaviorism, potentiality becomes, as Singer says, the "expectation of future behavior." Aristotle's form is cancelled or taken over into the physical organism, which for Watson and others, possesses inherent powers of operation.

Secondly, nature can be understood only from the standpoint of teleology. The physicist, in Aristotle's thinking, holds an important truth; but the philosopher, with superior insight, adds the fact that the last in realization is the first in form in relation to the nature of a thing. Nature works toward an end, which is not alone the last stage of the development, but a spread in concentric waves of growth from a central core of reality. Perfection is the goal sought; and purpose, determined by the final cause, is progressively realized in the develop-

ment. In the main, behaviorism has adopted this goal-striving process. Nature bears within its own bosom the power to advance to the goal; it displays an energy which is expended and re-directed at each stage of progress. It is not designed by any external agency, not even by the Creator himself; for this would reduce nature to a mere mechanical contrivance. The goal is mended by experience, in a step-by-step process of striving, of perpetual adjustment and risk, which constitutes the very essence of life itself. Many of the behaviorists of the more refined type have become exceedingly charitable toward the notion of teleology of a certain kind, and have made purpose a significant principle of interpretation.

Finally, there is a likeness discoverable between Aristotle and the behaviorists in the application of the principle of development and teleology relative to the soul-body problem. While behaviorism has strong philosophical allies, its chief concern is psychological. It seeks to ignore metaphysics altogether by restricting its science to the study of the behavior of lower and higher animal organisms. This may be called methodological behaviorism. While the behaviorists discard Aristotle's application of his metaphysical doctrine to the soul-body problem, they welcome his biological doctrine of development. The phase of Aristotle's conception which regards the soul as a function of the body, as "cutting to the axe," is acceptable to the behaviorists, but they repudiate the soul of transcendent affiliations. According to Aristotle the active element of the soul is reason, which is free and universal, concerned with the abstract and ideal, as contrasted with sense, which is limited to the individual, and deals with the concrete and material. The passive reason receives; the active creates. The latter unifies the world of thought by conferring upon the materials of knowledge order and meaning. As the rays of the candle, falling with peculiar, transforming selection over the surface of polished steel marked by multitudinous and irregular scratches, presents the magical effect of an ordered series of concentric circles round that central sun, so the active soul is the center and sun of illumination of experience whereby colors emerge and objects receive clear outline and the world is rendered intelligible. The world is but potentiality until mind appears to bring it into actuality, that is, into existence. It is this active element of the soul, as an efficient moulder of the material, that behaviorism casts out. Only the emasculated "form" of Aristotle has been retained by a few behaviorists. Even the soul as vital energy of the body is obnoxious to the majority, because this conception is too closely allied with vitalism, which in biology has been superseded; while the assumption of form or energy beyond the complex functioning of the organism is an offense to natural law.

Thus we see, in three important respects, similarities and differences between the behaviorists and Aristotle. For one, matter is potentiality, and needs the pure idea, God, whose essence is mind, to bring

it into actuality and fruition; for the other, matter is potential, the ground of all future development under the stimulation of environment. Teleology means, for one, perfection of form; it means, for the other, tropistic, reflexive, instinctive, and conscious or unconscious striving of the organism toward a goal or end within and in response to its environment. For one, the soul is the informing principle of the body; for the other, consciousness is the accompaniment of neural processes and nothing efficient, or it is just matter in motion. What Aristotle affirmed with all confidence is precisely what the behaviorists take great pains to deny, namely, that the soul is the organizing unity of the body, and that mind, as regnant in the cosmic order, fashions the material world. Inasmuch as the behaviorists despoil the universe of everything resembling an efficient mind, spirit, or "form," and rob the body of the semblance of a soul or consciousness the least degree informing, they have presented us, by stressing the physical organism as all sufficient, with a pale and sickly reversal of the Aristotelian creed. They have dichotomized the universe and cast the better half away. Nevertheless, from the matrix of Aristotle's thought, behaviorism has issued with modified conceptions of matter, potentiality, and teleology.

Behaviorism gathers momentum under the inspiration of the materialistic philosophy of Hobbes, which it resembles in three respects. First, motion in the outer object, which corresponds to the stimulus, causes motion in the sense organs. This causes sense perceptions, which in turn causes conceptions ("inward endeavor"), secondly, a response is set up ("outward endeavor"), and the result of these opposing motions is the "seemings," or "phantasms," which are brain motions objectified as outer objects.[3] A motion of objects as an external stimulus encounters the resistance of an opposite and internal endeavor, with the result that not only phantasms of sense but also imagines and ideas in the mind arise as motions.[4] He thus reduces the mental to motion and anticipates Professor Singer's conceptions of consciousness as "moving atoms." Finally, there is but a thin partition between Hobbes' notion that fear, love, anger, etc., are motions of the mind and are subject to physical contemplation, and the method of observation adopted almost exclusively by the behaviorists. Hobbes could have suggested to Singer his thesis, "Mind as an Observable Object."

Descartes rejected the vitalism of Aristotle. In his "Tract on Man," he gave us the conception of the body as a mere machine, whose life can be accounted for by the mechanical movements of its parts, operating under purely natural law. This gives comfort to some behaviorists, who refer to Descartes' conception of the body as a natural machine as the correct notion for behaviorism to adopt. In this sense, Descartes has

[3] Philosophy of Hobbes, Woodbridge Edition, 1903, pp. 99-100.

[4] Hobbes' Works, Molesworth Edition, Volume I, pp. 72-73.

made a contribution to behaviorism. His afterthought that the mind influences the body through the pineal gland, and the body the mind, the behaviorists reject, as Descartes himself would be compelled to do were he entirely consistent with his major propositions.

Upon the authority of Roback, Titchener's strictures of behaviorism as represented by Watson reveal a striking kinship between the psychological attitudes of Watson and Cournot and Comte. Roback adds that there is a close resemblance between the introductory pages of Watson's Behavior and Conte's Cours de Philosophie Positive.[5] Comte's positivistic philosophy and behaviorism have several things in common. They are both systems of phenomenality, eschewing all metaphysics. They are interested in the actions of organisms in society and in the laws that govern them. In his classification of the special sciences, Comte found no place for psychology; because its subject matter was soul or mind, and these are too metaphysical to be included in his system. Consciousness, in a metaphysical sense, is also repugnant to the behaviorist. Both, as a rule, make an onslaught on introspection, decrying it as an altogether subjective and untrustworthy method. Both stress the objective and scientific method as the only reliable and fruitful one. Comte makes psychology partly a biological and partly a sociological subject; some behaviorists stress the sociological aspect, but most stress the biological; and some make more of the physical and chemical aspects of the science. Kantor, De Laguna, and Tolman combine the physical and societary aspects to the neglect of the physiological.

With the dawn of the twentieth century, the way was speedily prepared for coming behaviorism. Attempts to dismantle idealism, bringing new conceptions of consciousness, must first subordinate mind by showing that consciousness is not the whole of reality, that reality is not even dependent on the mental, and that mind grows up within reality itself. Somehow, also, the cleavage between the psychical and physical, which had long been sharply drawn in conventional psychology, must be closed. The way was proposed by Professor H. B. Alexander in his conception of "experience" or final "seeming" which embraces both psychical and physical qualities without distinguishing them as such.[6] Since the days of Locke, the empiricists have been drawing as much of the world as possible out of the mind; the idealists have been drawing it within. After the process is completed, says Alexander, the two worlds coalesce and are one. Content is placed in environment; ideas and things are identified, and consciousness becomes an objective relation—a thing among other things. The ground is now laid for New

[5] Behaviorism and Psychology, p. 32.

[6] "The Concept of Consciousness," Journal of Philosophy, Volume 1 (1904), pp. 118-124.

Realism, which affords strong support for behaviorism. The objectification of consciousness was an important step toward its exclusion from the central place in psychology. This must occur before behaviorism could really get under way.

In December, 1903, Professor Perry denied to consciousness a metaphysical character and intimated that it can be known only objectively, thus striking a blow at introspection, and paving the way for the objective method of observation in the treatment of mind. "The first intent or bearing of experience is objective," he says. I can become aware of "my state" only going beyond it to objective experience. "I can introspect my state only as in retrospect I surround my former limited experience with my present objective experience and so discredit the former; my waking experience corrects my dream and goes beyond it. is more objective; nature intervenes to correct dreams and illusions and others correct me."[7] This is to define consciousness in terms of relativity. Perry has thus given impetus to the objective method and undermined the dignity of consciousness.

Perry carried the mind a step further toward the outer world. While he recognized that ideas and perceptions are in a certain sense private, they are not exclusively one's own. He opposed the "private" mind with the conception that a "thing's relation to me as my idea may enter into another such relation to you and become your idea."[8] His conclusion is that mind is not private, as the idealist supposes, but is open to the inspection of others. Seldom does the mind escape observation because it is revealed in the "motor action, in the motions of my body as a whole." Here behaviorism finds a chief cornerstone.

From 1903 to 1909 Perry grew so rapidly toward behaviorism that his whole insistence now is that mind "within" and mind "without" are one.[9] He is gradually approaching his point of view, as it is expressed in New Realism, that content and object are identical. It is with his ambiguity of content and object that Perry is able apparently to pull his theory of the independence of reality through.[10] He admits feelings and images but would not place them in the environment. They constitute the mind "within" which is a diminishing consideration. Introspection

[7] "Conceptions and Misconceptions of Consciousness," Philosophical Review, Volume II (1904).

[8] "The Hiddenness of Mind," Journal of Philosophy, Volume VI (1909).

[9] "Mind Within and Mind Without," Journal of Philosophy, Volume VI (1909), pp. 169-175.

[10] "A Realistic Theory of Independence," New Realism, pp. 99ff.

[11] "Mind Within and Mind Without," Journal of Philosophy, Volume VI, p. 171.

dwindles accordingly. It "tends to be distributive and so useless because merely repetitive."[11] This view is contrary to that held by most behaviorists, who say introspection is not repetitive and, therefore, not reliable. Introspection congeals direct experience of reality, "knowledge of first intent" and ruffles the "that" into "whats." It breaks experience into fragments and presents them merely in juxtaposition with the dynamic relations of the "object-manifold" wanting, while the principle which defines the group is known only by "objective behavior." "In short we can tell the content of mind only by watching behavior and the content is found in the natural environment as the organism selects it."[12] Just here Perry drags the "mind within," without. He goes beyond most behaviorists who identify mind with bodily behavior of some sort—nervous, muscular-glandular, or total, and links mind indissolubly with the environment. Mind embraces the aspects of interest, which means organic need, the body, and the objects select from the environment. This is mind completely objectified so that Perry can truly say, "Mind lies in the open field of experience as free to all comers as the motions of the stars or the civilizations of cities."[13]

Despite the balanced judgment of Roback that Professor James "was possessed of a slight behavioristic tendency" and "that he bears only a tangential relation" to behaviorism, when we consider the immense weight of his authority, his rich veins of thought from which the behaviorists have so freely mined, his insatiable appetite for physiology, his eagerness to find physiological bases for psychological states, his stress upon motor responses, we must give to James an important role in the early formulation of behavioristic doctrine, so important that we may believe James did more unconsciously to shape the behavioristic tendency than any other writer has done consciously to that end.

James was greatly impressed by Baldwin, Ward, Bawden, King, Alexander, and Perry, whom he regarded as "frankly over the border" in the denial that consciousness is an entity. These writers, in the opinion of James, had reduced consciousness to a "thoroughly ghostly condition." "I believe," says James, "that consciousness, when once it is evaporated to this state of pure diaphaneity is on the point of disappearing altogether. It is the name of a nonentity, and has no right to a place among first principles. Those who still cling to it are clinging to a mere echo, the faint rumor left behind by the disappearing

[12] Ibid., pp. 169-175.

[13] Present Philosophical Tendencies, p. 273.

[14] "Does Consciousness Exist?" Journal of Philosophy, Volume I (1904), pp. 277-278.

soul upon the air of philosophy. . . . It seems to me that the hour is ripe for it to be openly and universally discarded." [14] This sounds very much like Watson's iconoclastic utterances a decade later.

As we now discern, the history of behaviorism discloses a tendency to interpret consciousness objectively or to banish it altogether. James' negative answer to his own question, "Does Consciousness Exist?" means that consciousness is no receptacle for thoughts; no basket filled with apples; no sky filled with clouds which scud across it. He knocked the permanent sky out, leaving but the scudding clouds. There is no longer any metaphysical "self," "soul," or "mind," only passing thoughts remain. The "thoughts are the thinkers." Consciousness becomes a "function of knowing" by which "pure experience" is dirempted into "knower" and "thing known" with their relation which is objective and real. And finally, consciousness is transformed into relations among things with only a "feeling" of physical activity (mostly located in the head) left to represent the mental. Perry complains because James does not advance to the behavioristic position by substituting bodily activity for "feeling." When he recalls that James actually identifies "the stream of thinking" with "the stream of breathing," Perry would have less reason to complain.

All these interpretations and tendencies, which we have mentioned, signify a strong drift toward the empirical, the experimental, and the naturalistic point of view. Comparative psychology with its method of objective observation, experimental psychology, physiological psychology with its stress upon the neural processes, the prestige of the physical and social sciences, the dominant interests in the biological organism, and the philosophic revolt against idealism have conspired to create a suitable environment for behaviorism.

With such favorable conditions at the outset of the twentieth century, we should expect psychology to be influenced by the newer conceptions in other fields. In order to render their subject matter scientific, psychologists would be interested in making use of scientific method. This tends to reduce the subject matter of psychology to the physical category, and thus to provide a basis for behaviorism. Accordingly, we find that Professor W. M. Cattell shows a decidedly behavioristic bent.[15] He condemns introspection, and enters a plea for a scientific and objective method in the study of psychology. Professor John Dewey also lends strong support to behaviorism. Though his Essays in

[15] "Conception and Methods of Psychology," Congress of Arts and Sciences, Volume V (1904), pp. 597-598.

Experimental Logis were written from 1900, 1903, and onward (several of them before behaviorism became a psychological by-word), their psychological aspects are saturated with behavioristic interpretations, Dewey tells us in his "Prefatory Note." His general position is realistic and pragmatic, and looks to the interests of the biological organism. Consciousness and thinking spring up only at the instance of the organism's needs. While they are devoid of the "psychical," they are instrumental in the control of environment. The entire naturalistic background with the natural organism in responsive action to a highly complex order of stimulation provides conditions for the growth of behaviorism.

Behaviorism takes more definite form with the definition given by Professor McDougall: "Psychology may be best and most comprehensively defined as the positive science of living creatures." [16] He defines conduct as the "sum of activities by which any creature maintains its relations with other creatures and with the world of physical things." These activities include both conscious and unconscious factors, the latter lying beyond introspection. His definition, after eighteen years, has changed but little; for he still defines psychology as "the science of the human mind." [17] and mind expresses itself in experience and in behavior —the former, discoverable by introspection; the latter, by observation of activities. Both definitions reveal a double aspect; neither is a thorough-going behavioristic formulation. McDougall did something for the development of behaviorism, even sprinkling the pages of his Outline freely with behavioristic terms; but he has always appeared half-hearted in the matter, and, when Watson presented behaviorism in a "raw" form, he clung closer to the older way.

Kirkpatrick offers a strange sort of behaviorism of some merit. He represents the genetic point of view. He recognizes the need of "a science of behavior of organisms and organs" which he calls "organosis." His science would embrace all processes of living organisms down to the vegetative and up to the most abstract thinking. All are "intelligent," whether conscious or unconscious, because they are striving toward preservative ends of life. This entire realm of behavior is a concern of biology, physiology, and psychology. Consciousness presides over and influences (most behaviorists would not admit this much) the

[16] "Nature of Consciousness," Journal of Philosophy, Volume II (1905).

[16] Introduction to Physiological Psychology, 1905, p. 1.

[17] Outline of Psychology, 1923, pp. 37-38.

[17] Journal of Philosophy, Volume II (1905) pp. 561-568.

functioning of the organism as a railroad president presides over the vast details of a "great railroad system,"—rather loosely. "There is no more reason to doubt that consciousness influences behavior than there is reason to doubt the influences of the railroad president." [18]

Angell allows but little of behavioristic tendency to disturb the placid surface of his conventional psychology.[19] He does adopt the biological viewpoint that was the fashion of the day, and he even approaches the behavioristic conception in the statement: "We shall regard all the operations of consciousness as so many expressions of organic adaptations to our environments. . . . An organism represents, among other things, a device for executing movements in response to the stimulations and demands of the environment." [20] These expressions, joined to the fact that he developed a warm sympathy for behaviorism a few years later, indicate an incipient behaviorism.

By 1910, Angell scents the coming storm, as shown in his declaration at Minneapolis, that a shift to "some term like behavior will be made, which affords a more useful clue." He goes so far with behaviorism as to accept its stimulus-response formula; while he, at the same time, insists that the study of conscious activities by the introspective method is necessary to fill in the "intercalary processes" between stimulus and response, or else all would be dark within the "hiatus." He also accepts "objective observation" as a supplementary method. Angell cites the fact that conventional psychology is crumbling before forces more subtle than the criticisms of the militant new realists who volunteered to purge and redeem. Among these are a few of more or less historical import: The revolt against introspection, the interpretation of much social and racial psychology as well as economics and history by group action without reference to consciousness, and functional psychology, which regards the organism as unitary. These provide a convenient behavioristic mould. The "conscious-attitudes" psychology, as represented by Miss Calkins[21] and by Professor Judd [22] provides suitable foundation for behavioristic theory. All these influences have helped to shape the early program of behaviorism.

One of the most immediate causes of behaviorism, and most potent, is the comparative psychologist's violent rejection of consciousness because he can not employ it in his study of animal behavior. It is unscientific to guess what may occur in the mind of the animal. To be

Reason in Science, 1906, pp. 140ff.
"Broader Basis for Psychology," Journal of Philosophy, Volume IV (1907).
[19] General Psychology, 1904; Fourth Edition, Revised, 1908.
[20] Ibid., p. 8.
[21] Introduction to Psychology, 1901.
[22] General Introduction, 1907.

consistent, one must drop consciousness altogether in his investigation of the lower animals. The behaviorist is primarily interested in animal psychology and its objective method. He carries the method of the comparative psychologist higher and applies it to the study of man. Hence, Watson, one of the most consistent of the behaviorists, has pushed behaviorism to its logical conclusion. He studies the activities of the animal organism as a whole, and insists that the human organism must be studied as a whole, and objectively, without any reference to consciousness whatever. Considering the preparatory forces as setting the stage, behaviorism issued directly from the matrix of comparative psychology. As Watson says, it is an American product. At least this is true in its extreme form, and on its psychological side. It is philosophically allied "teleology," and especially the conception of the soul as a function of the with the materialism of Hobbes (through Singer especially); and, as Titchener points out, it is allied with Comte and Cournot. Perry, Singer, Holt, and McDougall are doubtless correct when they claim its kinship with Aristotle. But in its recent manifestation, which is real behaviorism, it is indigenous. Even Roback admits that "behaviorism, as a thorough-going system, did not take root either in the British Isles or on the continent."[23] Despite the fact that McDougall "defined psychology behavioristically," he will not now own the American child.

We shall now summarize the results revealed in this brief history. The behaviorists have appropriated important features of Aristotle's philosophy such as the conceptions of "potentiality," "development," active organism. But they have omitted the "form," the idea of God which, for Aristotle, made all activities efficient. The development of physiological psychology gave impetus to the interpretation of the nervous system and brain action. Experimental and comparative psychology encouraged the method of objective observation. Behaviorism issues directly from comparative psychology. The methods and triumphs in the biological field were extended to the psychological, and psychology passed from a philosophical to a biological subject. The objective methods of other sciences were applied to the study of consciousness, which prepared the way for its final departure. Organic activity was at length substituted for the mental and behaviorism was on in full force. Working through it all was a tendency away from the mystical and "supernatural" toward the empirical and natural, due to the splendid achievements of the special sciences, and consequently to a disposition to extend to all realms the reign of natural law. These are the most significant influences that have ripened into the behavioristic tendencies of the day.

[23] Behaviorism and Psychology, p. 39.

This article is the first of a series which will appear in The Techne on the subject, "Types of Behaviorism and Their Metaphysical Implications." It is a brief sketch of the prebehavioristic tendencies which have helped to shape the behavioristic creed. The second article will deal with the factors which have contributed to the definite formulation of contemporaneous behaviorism. The third and fourth articles will be concerned with the particular type of behaviorism represented by Watson on the psychological side and by Singer on the philosophical.

AMERICAN YOUTH AT COLLEGE

President W. A. Brandenburg, Kansas State Teachers College of Pittsburg

(Sharp disagreement with William Allen White's recent assertions that large numbers of students go to college merely for the sake of the social prestige thus gained, and that she post-war increase in college attendance was caused by an increase of money in the country, not by a new interest in things cultural, is voiced by President W. A. Brandenburg of Kansas State Teachers College of Pittsburg in an open letter in reply to Mr. White's editorial. For the reader's convenience, the editorial is here reprinted in connection with President Brandenburg's reply.)

THE TURN OF THE TIDE

(Editorial by William Allen White in the Emporia Gazette, Oct. 7, 1927)

This year the state institutions had no increase in enrollment. The normal schools are at about a standstill. The university gained but 45, and the agricultural college lost 200. The reason for this is any man's guess. Here is our guess. After the war and by reason of the war all over Kansas and indeed all over the United States, and to a certain extent all over the world, a wide stratum of population came into an economic status which gave them a surplus large enough to send their children to college. The children were sent to college not so much to acquire a good education as to acquire a social position which the parents otherwise felt they couldn't give to them. Hence our American colleges after the war boomed tremendously but chiefly in the matter of attendance. Thousands of young American boys and girls with no cultural background and with no desire for cultural background were going to school to learn social forms, to acquire a social veneer, to get into sororities and fraternities, and to become members of what they thought was polite society; which, by the way, was a hollow sham. A lot of them have found it out. They have found that to all intents and purposes if one is not interested in things of the spirit, a college education is no good. If a man merely wants to make money without enjoying money he's a fool to waste his time in college. This the large hoard of rough-neck students who bawled around the great stadiums and roared through the halls of the new mushroom buildings of the American colleges, are finding out. They are staying at home. And now and from now on it is very likely that the taxpayers will be relieved of a further burden required to give these people something they don't want, can't use, and never will need—the refinements that come to those who want to live life well and beautifully rather than those who want to make money to spend riotously.

This is one of the causes for the failure of the state institutions of Kansas to increase their enrollment. There are others. What is your guess?

Hon. William Allen White,
Editor, Emporia Gazette,
Emporia, Kansas.
Dear Editor:

Your recent editorial entitled: "The Turn of the Tide," is somewhat interesting, and greatly amusing.

You state that this year the state educational institutions had no increase in enrollment—that the normal schools are at a standstill. Of course, you mean the teachers colleges, as Kansas has no normal schools.

I can not speak for the enrollment of other state institutions of higher learning, but your statement with respect to this Institution is incorrect. Note the following:

Campus Enrollment of the Kansas State Teachers College, Pittsburg, Kansas, Not Including Enrollment of the Elementary Training School:

	Year	Number
Fall semester	1916	779
Fall semester	1917	703
Fall semester	1918	982
Fall semester	1919	747
Fall semester	1920	784
Fall semester	1921	1,193
Fall semester	1922	1,368
Fall semester	1923	1,409
Fall semester	1924	1,475
Fall semester	1925	1,562
Fall semester	1926	1,714
Fall semester	1927	1,921

From the above, note the smaller enrollments for the years 1919 and 1920, then the gradual increase each fall semester to the present.

But the particularly amusing thing to us is "your guess" as to the causes of this presumed slump in attendance. You state that after the war, and by reason of the war, that all over Kansas, the United States, and the World—well that takes it all in, no doubt about that—a wide stratum of population came into an economic status which gave them a surplus large enough to send their children to college. Have you investigated to ascertain whether those who came to college came mostly from that stratum of population which you claim were blessed with a surplus, or whether a majority of the college students after the war came from quite a different class?

This Institution never experienced a crowd of students, where so great a number of them were poverty stricken, and were demanding opportunities to do work to defray a part, or all of their expenses while attending college, as was manifest in immediate post war groups. Just the contrary from what you state, was true with respect to our observation and experience.

You state, that the children were sent to college, not so much to acquire a good education, as to acquire a social position which their parents otherwise felt they couldn't give them. If you meant by "social position," that they were sent to college to equip themselves for efficiency in some part of the social life of our people, taking social life to comprise the useful occupations of our people, then we could heartily agree with you; but we feel you do not mean "social position" in that sense at all. Now isn't it a fact that the world war experiences taught us as we have never understood it before, the real value of the right kind of education? Might not a recognition of this, on the part of parents and young people as well, be one of the big causes for the

enthusiasm enkindled for education immediately following the war period?

Again you state, that our American colleges after the war "boomed tremendously," but chiefly in "matters of attendance." Now honestly, have you investigated to ascertain whether the colleges, institutions of higher learning throughout our nation, did not extend, enrich, and make more practical their curricula immediately following war years? And is it not a fact, that our colleges "boomed" in this direction as well as in the attendance of which you speak?

Again you speak of thousands of young American boys and girls with no "cultural background," and with no desire for "cultural background," who came to our colleges to learn "social forms," to acquire "social veneer," whose primary purpose was to get into sororities and fraternities, and to become members of what they thought was "polite society." Surely you do not mean to so belittle, and even slander the ambitions of so many American boys and girls. Just what do you mean by "cultural background?" For many years we have all been seeking for a definition of culture, and also an understanding of what constitutes a "cultural background" without very conclusive or satisfactory results. Would you be so kind as to give to the public the benefit of your definition?

As to the "social forms" and "social veneer," you must certainly be considerably out of touch with the spirit and purposes of the young men and young women attending our colleges and universities through the years since the war. There is little, if any evidence, of a desire for "social forms" beyond that which would be legitimate, and certainly no desire for the acquiring of a mere "social veneer," except with the few that we have always had about institutions of higher learning. The decidedly great majority of the young men and young women attending our colleges and universities today are of serious mind, and of most wholesome ambition, concerned wholly in that which is genuine. Can we afford to indict or malign the serious-minded body of young men and young women in our colleges simply because we do have always a few that are otherwise, who represent, or make up the small sordid spots in college life?

You have aroused our curiosity in the statement: "If one is not interested in 'things of the spirit' a college education is no good." Is anything of much value which is without "things of the spirit?" We take it for granted, that the whole atmosphere of our institutions of higher learning today is such as to promote an interest in "things of the spirit." We think any fair-minded investigator will find this to be true. We agree with you, that one who wants "to make money without enjoying money" is a fool to waste his time in college. Would he not be just as much of a fool to so waste his time somewhere out-

side a college? We would not contend that college students are perfect. At best or worst, they are largely "chips off the old block," and if they were perfect, do you think they would be honest representatives of the parentage from which they come?

Again you speak of this great crowd of college young men and young women as being "roughnecks" and "bawling around stadiums, and roaring through halls of new mushroom buildings." No denying, they do make a good deal of noise around the stadiums, and some times they are not as quiet in the halls as they could be; but remember, they are full of life,—the spirit of youth,—bent on success in what they are doing, or trying to put over; we would not think much of them if they didn't make a good deal of noise, and manifest a real interest and spirit in their program. However, we have heard and observed men, and women, too, making a great deal of noise in political campaigns, and through editorial columns. We had not thought of calling this noise "bawling," but perhaps that is the right name; at any rate, their speeches and actions may be to some as inconsistent and distasteful as the roar which comes from a student body following a football game, or some other college contest.

You say they have discovered the emptiness of it all, and are therefore staying at home. Have you real definite information which justifies this part of "your guess?" Personally, we have been over the state somewhat, and have heard scores of young men and young women express great regret that they are not able to get into colleges, even with an opportunity to work a part of their way through; so "our guess" is, that many more men and women would be in college today if they were possessed with that "economic surplus" of which you speak.

Despite the many changed conditions in our social life, changes which have made it difficult during the last 10 years for young people to maintain their proper social and moral equilibrium, we must say in justice to the college student of today, that young men and young women, in college, were never more serious-minded, never better behaved. The general moral standards of our young people in college are most certainly getting better from generation to generation; and the next generation will take our places in a few years, and they will do a better job of directing a college than we can possibly do, and perhaps they will write as good editorials as the good editor of the Emporia Gazette is furnishing us.

Isn't it passing strange that each generation falls into the unjustifiable and naughty habit of exalting the virtues of its youthful years, and discrediting the virtues of the oncoming generation. What you and I need is more faith in the sincerity, and the potential virtues of these young men and young women.

There is no failure on the part of the colleges of Kansas, they are stronger and better today than ever before. Neither is the slump anywhere sufficient to provoke undue anxiety or comment. There is nothing alarmingly wrong with the Kansas young people, or the "cultural back ground" in Kansas. So "our guess' is, that "your guess" will bear further investigation. Very truly yours,

W. A. BRANDENBURG,
President, Kansas State Teachers College, Pittsburg, Kansas.

TEACHING

There's so much of real enjoyment;
Pleasure, too, has ample share
For the teacher who's been teaching
Basic facts of earth and air.

Oh, of course, some days are AWFUL,
Weighted down with toil and fret;
There are always Johns and Marys
To be loved and petted—yet,

Somehow when the day is over—
When you sit and think it through;
There's a joyous exultation
In the job you've tried to do.

Really deep abiding pleasure
In the dreams you've dreamed of each;
Climbing up, and up, and upward
'Till your goal for them, they reach.

So, when hard things come, remember
Battles make or break your strength
And 'tis your resistant effort
Measures YOU— your breadth and length.

—Jennie C. Walker.

A SIXTH GRADE ARITHMETIC CURRICULUM

Ernest E. Stonecipher, M. S., Department of Rural Education, K. S. T. C., Pittsburg

This curriculum is made primarily for use in the schools of Kansas and is therefore based largely on the adopted texts for the state, John C. Stone's "Intermediate Arithmetic." It is not designed to displace the State Course of Study, but to supplement it, and any teacher attempting to use the outline should adapt it to the state course and to local conditions. At the time it was written, the State Department of Education had not changed its outline to suit the new texts, and for this reason the pages for each month may be slightly different from those given in the state outline.

In devising a course of study, the first essential thing is to determine the objectives for each grade, the second thing is to determine standards to be achieved, the third to establish working principles. We are then ready to outline the work and to devise processes and means for attaining the objectives and achieving the desired standards.

The objectives, standards, principles, and working suggestions here given will be useful in connection with any text, but the outline by pages will be adaptable to Stone's text only.

Sixth Grade Objectives for Arithmetic

1. Develop increased skill in accuracy and speed in computations with whole numbers. Extend this skill to the use of larger numbers

2. Extend pupil's mathematical vocabulary to include the ready use of the common terms found in sixth grade arithmetical processes.

3. Review and extend his skill in the use of common fractions. Make automatic the skill in the use of the very common ones.

4. Review and extend the use of decimals. Develop a vivid ideal of the importance of the decimal point. Develop the relationship of decimal fractions and percentage.

5. Develop the power to express relationships and ratios by the use of graphs and charts. Train pupil to read graphs.

6. Help child to use percentage and to see per cent as another way of expressing the decimal fraction and ratios.

7. Teach familiar usages of common business forms and processes, such as notes, checks, bills, and accounts. Train pupil to write, interpret, and compute, the processes involved in the use of these business papers.

8. Extend skill in the computation of areas and volumes with common, plane, and solid figures, such as the area of floors and fields, the volume of bins and boxes.

9. Develop increased power to solve more complex and larger problems involving reasoning—quantitative relationships.

10. Increase the power and skill in evaluating and checking results.

Standards of Skill for Sixth Grade Arithmetic

(From Stone's "Manual of Arithmetic for Teachers")

Sixth grade pupils should maintain and improve on the fifth grade standards for the fundamentals, which are:

I. Addition.

1. Twenty-five exercises of six one-figure numbers in five minutes or less.

2. Twelve exercises of five-figure numbers each, in five minutes or less.

II. Subtraction.

Fourteen exercises of five-figure numbers with two or three carryings, in five minutes or less.

III. Multiplication.

1. Twelve exercises of two-figure multipliers and multiplicands in five minutes or less.

2. Six exercises of a four-figure number by a two-figure number in five minutes or less.

IV. Division.

Five exercises of a five-figure number by a two-figure number with a three-figure quotient and a remainder, in five minutes or less.

Beyond the maintaining of the fifth grade abilities, the sixth grade should develop these skills.

Fractions (See chapter 9 in Stone's "Intermediate Arithmetic")

1. Add six problems with five figures, each containing a fraction, in five minutes or less.

2. Subtract eighteen examples, each containing a two-place number and a fraction, in either term, in five minutes or less.

3. Multiply six problems of three-place multiplicands by a multiplier, of one number and a fraction, in five minutes or less.

Multiply eight problems like 7/8 by 13/16 in five minutes or less.

4. Set other standards for divisions of fractions, decimals and solution of simple problems. Set standards for both power to solve, and speed.

Some Teaching Principles to Keep in Mind

1. "Economy in learning is a matter of proper habit formation"—Stone.

2. "Teach that which the child can learn and will need, and spend no time in teaching that which he will never need and can not learn." —Osburn, "Corrective Arithmetic."

3. "Skill comes from attentive repetition under the guidance and inspiration of clear ideals."—White's "Art of Teaching."

4. "Reasoning is the co-operation of organized habits."—Thorndyke.

5. "Bonds should be so made that they readily become a part of another bond."—Thorndyke.

6. "Proceed from the old familiar processes and knowledge to the related new, in introducing new topics."

7. "Other things being equal, one new set of bonds should not be introduced until the previous set is fairly well established and two new sets should not be started at the same time."—Thorndyke. (Don't make the computations long or difficult in long division, until the process is firmly fixed.)

8. "Other things being equal, bonds should be so formed that none will have to be broken later."—Thorndyke. (Don't let pupils learn to add by counting, or to place the number carried at the top of the next column, etc.)

9. "There must be frequent diagnostic testing to locate weaknesses, and the child should be shown how to correct errors and be given much drill in overcoming his weaknesses."

10. Drill most on the most common mistakes. Three-fourths of all errors are in seven simple processes, namely, multiplication tables, addition combinations, carrying, borrowing, inverting the divisor, reduction of numbers, and use of decimals.

Use a profile chart to locate the causes of failure in your problem cases. Draw vertical lines giving you ten vertical columns, mark the central line as 100 per cent, the one on the extreme right 150 per cent, the one on the extreme left, 50 per cent. Each column then represents a 10 per cent advance. Check the failing student on at least ten characteristics, or qualities, indicating in the vertical column his standing, somewhere between 50 and 150 per cent of the median student's standing.

The following qualities are suggestive of what you may use in your profile chart:

Chronological age.
Mental age.
Health habits.
Physical energy.
Play habits.
Social attitude.
Attention habits.
Power to follow directions.
Study habits.
Grade on Standard Achievement tests.
Rank on tests prepared by teacher.
Class recitation rank.
Final composite grade.

A careful checking of a pupil's standing against these, or any ten or twelve similar points, will reveal to any interested teacher some things that she does not learn by general observation.

Suggested Teaching Material for Teacher's Help

1. State Text, Stone's "Intermediate Arithmetic."
2. "Teacher's Manual For Stone's Arithmetics."
3. Osburn's "Corrective Arithmetic"—Houghton Mifflin.
4. Knight's "Sixth Grade Arithmetic"—Scott Foresman Co.
5. Knight, Ruch, Studebaker, "Arithmetic Work Books for Sixth Grade"—Scott Foresman Co., Chicago.
6. Compass Diagnostic Tests, Stanford Achievement Tests. Book Co.

Suggestions on Class Organization in Graded Systems.

1. Divide the class into at least two groups on the basis of ability. Use intelligence scores, if your principal has them on file, teachers' marks and previous records, as well as achievement tests, as a basis for determining ability.
2. Change pupils from one group to another as occasion may demand.
3. Use the Knight, Ruch, Studebaker Work books according to instructions, keep class and individual progress charts as given in the work books.
4. Keep individual profile charts for all problem cases.

Outline of Work for the Year.

(Pages 160 to 320 in Stone's "Intermediate Arithmetic")

Topics to be Studied:

1. Review and extend use of simple fractions.
2. Graphic representation of simple ratios.
3. Ratios expressed as decimals and as per cent.
4. Use of per cent in simple situations.
5. Decimal fractions.
6. Comparing numbers by use of graphs.
7. Percentage.
8. Application of percentage and use of business forms and terms.
   (a) Promissory notes.
   (b) Discount.
   (c) Profit and loss.
   (d) Accounts and bills.
   (e) Interest.

9. Practical measurements.
   (a) Triangles.
   (b) Parallelograms.
   (c) Trapezoids.
   (d) Measuring lumber.
   (e) Rectangular prisms.
10. Develop familiarity with needed arithmetical terms.

Problem Solving

Some think that Stone's text is a little weak in actual solving of problems and in the developing of reasoning abilities. It is suggested that this phase of the subject be supplemented as is needed. Always train the child to read carefully his problems, asking himself these questions as he reads:

1. What does the problem ask for?
2. What is given?
3. What are the right things to do?
4. What would be a reasonable answer? (Estimate the result.)
5. Do my solution and result check accurately?

Outline by Months

First Month—Pages 161-176

"Teach first and most thoroughly that which the child will need most."

1. Spend two or three days on review drill, pages 309-312.

2. Make use of drawings and objects to show that a fraction represents a part of a whole. Present new topics objectively when practical. For example: place on the blackboard a drawing of a rectangle, divide into three equal parts, color one and leave the other two natural. Ask the children, "How many parts in the drawing?" "What part of it is colored?" "What part is uncolored?"

3. Develop the idea of the ratio of the colored to the uncolored part, i. e., as 1 to 2. Show that the fraction represents division also. Note how your text shows the relation of a fraction to ratio, also to a decimal. Study carefully the development in the text. Take plenty of time to get these ideas clearly in the minds of the learners.

4. Give the Compass Diagnostic Tests the second or third week to discover weaknesses. Tabulate results and drill on the weaknesses.

5. Introduce the use of Knight's work books about the third week; use largely for diagnostic purposes.

Be certain the pupils know the meaning of the arithmetical terms used. "Make automatic the terms and processes the child will have need of in everyday life."

Second Month—pages 177-195

"Skill in anything comes through much practice with attention and an aim."

1. Give tests on pages 193-195. Note failures and drill on correcting them.

2. Short drills daily for speed and accuracy. Encourage pupils to make practical problems from their own experience.

3. Have pupils solve problems without numbers, to learn the principles of problem solving.

4. Watch the arithmetical English used.

5. Continue the use of work books and the progress charts as shown in the books.

6. Begin to make profile charts for weak pupils.

7. Show how decimals are more convenient than common fractions, by comparing .5 to ½; .25 to ¼. From this develop a method of changing common fractions to decimals.

Third Month—Pages 195-197

"Be ye doers of the word and not hearers only."—James 1:22.

Teach the child to think for himself. Show him how to attack, but do not solve problems for him.

1. Give Standard Achievement Tests early in the month.

2. Teach changing common fractions to decimals. Be certain that children understand each step in the process.

3. Develop inductively all rules. Then have pupils write them out accurately and memorize. Use frequently in drill.

4. Teach how to check results and drill on the process.

5. Be patient and exacting in seeing that pupils understand the new processes on pages 204-208,—that is, dividing and multiplying by 10 and its multiples.

6. Continue use of work books and progress charts.

7. Give objective tests of your own making. Give drill on the work in which pupils fail.

Fourth Month—Pages 213-235

"Make automatic the facts and processes the child will have much need of." Strive for 100 per cent accuracy in the fundamentals.

1. Continue drill in use of decimals. Be certain to test the principles and processes given on pages 213-214 of text.

2. Use practice exercises on pages 217-224 to motivate and develop speed. Try to attain given standards.

3. Learn automatically the use of aliquot parts, pages 225-226.

4. Teach how to find averages. Supplement with practical problems from ball players' batting averages, average grade, or age of the class, etc.

5. Take time to show how facts are represented by graphs, pictures, charts, etc. Bring illustrations from magazines and books.

6. Stress speed and accuracy this month. Keep up use of work books, progress and profile charts.

Fifth Month—Pages 235-246

"Group rivalry is a good thing to motivate drill work. Every child should be interested in the work of the other members of the group."—Denver course of Study.

1. Review tests on pages 312-313.

2. Use work books one day a week and diagnose the results. Give short drills two or three times a week on processes where the class is weak.

3. Take time to motivate and make clear the use of graphic representations. Find where graphs are used in pupils' geographies, civics and other texts. By questions, show how graphic representation saves time, makes vivid and clear the facts and indicates relations.

4. Give work on constructing graphs; compare graphically Kansas, New York and Texas as to area, Kansas production of wheat with that of Missouri.

5. Show the use of the broken line chart. Use squared and ruled paper for constructing graphs. Graph the grades of the class on one of the tests.

6. Show that per cent is another name for hundredths and that it expresses ratio or relationship. Spend plenty of time in developing clearly these ideas. Use material on pages 241-243 of the text.

Sixth Month—Pages 246-260

"Drill most on that for which pupil has greatest need."—Osburn.

1. By many simple problems, develop clearly the idea of per cent as a decimal, that is, as hundredths. Emphasize the importance of the decimal point.

2. Give frequent short tests to test pupils' knowledge and skill. Use tests for diagnostic purposes as well as practice. Discover and correct the specific weakness of each pupil.

3. Supplement the exercises on estimating per cent in terms of simple fractions. Try to select practical problems.

4. Watch carefully the new steps involved in each new type of problem. Explain and illustrate the step by comparing it to previous processes.

5. Explain and illustrate that finding the per cent (p.257) of a given number is but multiplying that number by the per cent expressed as a decimal.

6. Continue the use of work books and progress charts.

7. Give at least two objective tests and score results as correct only when absolutely right.

Seventh Month—Pages 260-280

"Teach what the pupils do not know, not what they already know."—Osburn.

1. Give Compass Diagnostic Tests and note group and individual weaknesses.

2. Use material on pages 260-264 to overcome weaknesses. If more drill is needed, use material on pages 315-316.

3. Introduce objectively business forms and processes. Secure notes, checks, etc.)

4. Study discount, commission, profit and loss, bills and accounts. Select practical problems, using costs of pupils' books, grocery accounts, etc.

5. Have pupils make out bank notes, checks, etc., and discuss them in class. Also solve problems taken from these.

6. Continue the use of work books and progress charts. Use for diagnostic and remedial purposes.

Eighth Month—Pages 280-308

"Each bond that is formed and each process developed should pave the way for the one that is to follow."—Thorndyke.

1. Use work in denominate numbers, pages 280-290, to develop skill. Make use of frequent, short, snappy drills to develop quick thinking.

2. See that pupils understand the meaning and use of all formulas. Make clear distinctions as to meaning. Use abstract numbers in all computations (see text). For example, the area of a rectangle is not 4 ft. times 5 ft. but 4 times 5 times the unit of area (sq. ft. in this case).

3. Give much practice in practical measurements. Introduce the study of triangles and parallelograms by using pieces of card board cut into desired shapes, by drawing on blackboards, measuring of desk tops, floors, school yards, house gables, etc.

4. Develop the formulas for finding areas. Be certain that pupils have a working idea of what formula means.

5. Take especial care to see that all mathematical terms are understood. Examples: dimensions, area, perimeter, etc.

6. Introduce the study of solids by using boxes. Develop formula for finding volume.

7. Provide many practical problems in measuring and finding volume and area from the experiences and interests of the pupils.

Ninth Month—Pages 309-322

"The pupils should have developed proper habits of reasoning and computation by this time."

1. Give Stanford Achievements Tests, note results, review and drill where necessary.

2. Complete work books and progress charts.

3. Complete the profile charts. Study them carefully and let them help you determine what to do about promoting the backward pupils.

BOOK REVIEWS

NEW TYPE QUESTIONS IN CHEMISTRY

In my judgment, Doctor Cook has arranged a series of good questions which might be used with any text in the subject of general chemistry. In a very skillful way he has combined the newer type of objective tests along with the old essay type of examinations. In my judgment, the book will be of considerable assistance to any teacher teaching the subject of general chemistry.

J. A. YATES,
Head of Dept. of Chemistry and Physical Science.

MEYER, ADOLPH E.: FUNDAMENTALS OF GERMAN
(Globe Book Co., New York, 1927)

In the brief compass of less than 160 pages Dr. Meyer has included an orderly presentation of forms and chief syntax uses, abundant and varied exercises, common classroom expessions, and alphabetical verb table, a list of verbs carefully distinguished from others deceptively similar, and a chapter on prepositional idioms that will save an enormous amount of searching.

All is presented in clear, simple statements excellently fitted for the main purpose of the book, a second or third year review. Format, paper, type and binding contribute to the usefulness of the manual.

Results of the Modern Foreign Language Study are nowhere mentioned, but considerable familiarity is evidenced. The vocabulary consists of about 700 words and about 300 idioms. For class use, the teacher should have at hand a frequency table of words and idioms; it would perhaps unduly increase the size of the grammar to include them in the book.

Dr. Meyer has, on the whole, furnished us with a very useful and helpful book, especially for fixing forms and principles and for giving the pupil confidence in his command of oral and written German.

SAMUEL J. PEASE.

FOOD POISONING

J. R. Wells, Associate Professor of Biology, K. S. T. C. of Pittsburg.

The term food poisoning has been used for a rather long period of time to account for a great variety of more or less frequently occurring digestive disturbances, and in many cases, especially up to quite recent times, it was applied to ailments which had little if any thing to do with true food poisoning, such as appendicitis, gallstones, etc. Even yet the term food poisoning means to many only ptomaine poisoning, which seems only a natural thing to expect because of the peculiar emphasis that has been placed on the possibilities of poisoning from this source—and more because of the lack of understanding of the true nature and exceeding rareness of the true ptomains.

During the last half century our knowledge of bacteriology has so rapidly been increased and extended that it has caused a revolutionizing of our ideas of food poisoning as well as those of practically all other types of human ailments, and that today it is considered a general term which applies to a number of very different human afflictions all of which are directly concerned with food in some respect.

How long food poisoning has been recognized and how frequently it has occurred are only conjectural and not definitely known. There is very little doubt that many more alimentary disorders from food poisonings have existed than have been recorded. Most persons have at some time experienced gastro-intestinal attacks of a mild nature which could logically be attributed to some particular article of diet eaten previously, and many of these individuals were able to say just what food it was. Such cases are seldom if ever recorded. It is the case that is severe that occasions enough attention to cause it to become known and, possibly, recorded. Occasionally there are outbreaks of a moderate nature involving quite a number of persons which become well enough known to bring about recording.

In the great majority of the cases of food poisoning the effects on the individuals are only temporary, but there are many which prove to be of long standing or fatal, especially with certain definite types of food poisoning, and these are the ones which have caused the subject to receive serious attention and study.

The extent of food poisoning is difficult to find out with any degree of certainty because of the lack of reporting of such cases and because of the failure to recognize mild instances. Jordan says it is probable that in the United States alone there are at least fifteen thousand to twenty thousand persons so affected each year. The extent in foreign countries is as uncertain as in the United States for the same reasons, although in a few of the foreign countries certain forms of food poisoning are reportable and very good records have been kept for quite a long period of time, as in the case of botulism in Germany.

There seems to be no great difference in the seasonal incidence of cases, although in looking over the reports of outbreaks one notices slightly more for the warmer months, and it seems not to be very common in cold climates. Age has little if anything to do with the morbidity of food poisoning.

There are several ways of classifying cases of food poisoning and each is quite largely dependent upon the particular individual who is doing the grouping. Osler divides them into two classes: (1) **Endogenous,** those cases arising from the use of foods which normally contain harmful substances and are chiefly eaten by mistake; (2) **Exogenous,** outbreaks from food which has been accidentally contaminated from outside sources. He says the former can hardly be considered in discussions of true food poisoning. Jordan includes a greater variety of cases in his book on food poisoning. In addition to the ones named above he includes **protein sensitization, deficiency diseases;** cases due to the use of foods which have had harmful substances added to them for the purpose of preserving or improving the external appearance; and **cases of unknown origin,** such as milk sickness.

In this paper I shall exclude the last three above mentioned, emphasizing primarily those of bacterial nature and those resulting from anaphylaxis, and including a brief discussion of those caused by the ingestion of foods containing normally present harmful substances.

Poisoning from foods containing harmful constituents is not a very rare thing in the United States. It is a well known fact that certain plants and animals are possessed of tissues which have in their make-up deleterious substances, although these are often very difficult to differentiate from the harmless members of their group. Fortunately, however, the number of such is not great compared to the number of the harmless ones and in most cases the detection of these is possible if proper precautions are taken. It has been estimated that of the approximately seventeen thousand leaf-bearing plants, there are about five hundred that are either poison, or suspected as being so.

In the United States mushrooms are the most common source of food poisoning resulting from the ingestion of plant foods containing normally present injurious substances. Most of this is accidental and is due to the fact that quite a number of edible forms are very similar to some of the most deadly species and therefore are only with difficulty distinguished from them. Poisoning of this sort is the best known form and it has been more frequent of late years than formerly, a frequency due, probably, to the increased population and to the more gradual increase in the use of mushrooms for food. The New England states seem to have suffered most, probably from the great influx of foreigners from southern Europe where the mushroom is more exten-

sively used for human consumption. Not rarely do these people mistake a deadly species for an edible one of their native land.

The group of Aminita mushrooms is the one most commonly causing fatalities. Several species of this group are found in America but Aminita muscari and Aminita phalloides (death cup) are the most important from the standpoint of mortality. Ford (Jour. Inf. Dis. 3) states that the latter causes from twelve to fifteen deaths every year in the United States. The poison of Aminita (muscarin) has been carefully studied by Kobert and by Ford and has been shown to possess a powerful hemolysin which, though inactivated by heating, remains toxic for man and other animals, attacking especially the kidneys. So far, no treatment for this type of poisoning has been successful, although atropin has been used to some advantage, being an almost specific antidote. Attempts have been made to produce antibody formation by animal inoculation, but with only slight success. Even though it were a success, it is doubtful if it would be any great factor in the reduction of the mortality from what it now is because the onset is so sudden, the toxin works so rapidly, and the cases are so sporadic. Mortality from this type of poisoning ranges from sixty per cent to one hundred percent.

There seem to be some few types of mushrooms that are considered edible which at times are found to be injurious. The extent of such instances is not definitely known since the knowledge would involve experimentation with human beings to prove it. One such species in America is Paneolus papilionaceus (Verrill—Science 40:408).

The continued use of meal from grains contaminated with the ergot fungus produces a series of symptoms commonly known as ergotism, epidemics of which have prevailed in various parts of Europe. This disease appears in two forms—gangrenous and convulsive, each due to a different substance contained in the fungus, the former to sphacelinic acid and the latter to cornutin. The gangrenous type usually affects the extremities, especially the fingers and toes and rarely the ears and nose.

The water hemlock, an allied species of the long-famed poison hemlock, is not infrequently the cause of fatal food poisoning due to the nature of the underground part of the plant when exposed by washing out, resembling horse radish and artichokes and thus being mistaken by small children. Eight such cases occurred in New Jersey in one year.

There are a few cases of food poisoning which are the result of rare accident and hardly seem of enough importance to deserve anything more than a passing reference, e. g., poisonings from the ingestion of plants or parts of plants rich in oxalic acid; the use of false hellebore for marsh marigold; the eating of the castor bean, which contains a

powerful toxin (ricin), being a not rare occurrence among children. There is a poisonous sumac (United States Public Health Report 35:443) which has been incriminated in food poisoning, although rarely. The poison hemlock of ancient day fame needs only to be mentioned to cause one to recall its role in the destiny of many from history and the Bible.

Jordan describes an outbreak in Hamburg and about thirty of the immediately surrounding towns in 1911 involving two hundred persons and due to the use of a vegetable fat in margarine for a butter substitute, and warned that other countries can well afford to be on the alert for something of this nature as the result of the continued economic pressure for cheaper foods.

In summing up the role of poisonous plants in outbreaks of food poisoning in the United States, it can safely be said that the total number of common ones is probably not more than twenty-five, and that most of us will likely never have occasion to be worried about even these few.

Definite knowledge of the exact nature of poisoning from animal sources is for the most part lacking, although in a few instances there is enough evidence of a convincing nature to establish its certainty. Some authors seem to feel that there is only a very limited number of instances where normal animal tissues are poisonous, which I believe is the more nearly correct idea. It is quite generally accepted that some of the fishes, especially of the warmer waters, possess tissues which are harmful, and there is at least one example of cold water fishes—the Greenland shark—that is poisonous. A few seem to be poisonous only in the spawning season. Of the harmful warm water fishes the puffers, or balloon fish, are the best known and of these the Japanese Fuga is the most important.

Savage (Jour. of Hygiene 17:20) says that the greatest number of cases of food poisoning is due to the presence of pathogenic organisms in foods, and that of these the majority are caused by some member of the Gaertner group of bacilli. This, he thinks, is true especially in some of the foreign countries, where the emergency killing of animals is practiced to prevent a total loss to the owner. In America such does not happen—legally, at least, and so the dangers are not so great for this type of food poisoning. However, cases of this sort are now being recognized in this country and reported at varying intervals, ever though we have an elaborate system of inspection of meats.

The practice of using rare meats, or even uncooked, seems to be the main factor in infecting susceptible individuals, although the role of the carrier in contaminating meats properly prepared is not to be minimized or overlooked, as is shown by Savage (Journal of Hygiene 17:460).

Food poisoning from the ingestion of pathogenic organisms may be divided, roughly, into two classes—those arising from the presence of pathogenic bacteria, and those due to micro-organisms of the animal kingdom. The former are the more important and are much more common, since Trichinosis is about the only one of the animal group that is encountered and that not frequently in this country. The trouble is caused by Trichinella spirallis and comes from the use of pork improperly cooked and infected with the organisms. Rats are responsible for the infection of swine, and rats get it from other rats from their cannibalistic habits. Proper cooking of the meat will always make for safety from infection, but once a person is infected, there is little that can be done to dislodge the parasites from the muscles after they have encysted.

The cases of food poisoning from pathogenic bacteria can be divided into two groups according to whether or not the effects produced are true infections or are the result of ingesting a poison which has been formed in the food outside the body. Infections with members of the Gaertner group are examples of the former, while the best illustration of the latter is botulism.

Botulism is caused by the ingestion of foods containing the toxin of a spore bearing anaerobe, bacillus botulinus. The disease was first common in Germany and was recognized as early as 1735 (Dickson—Am. J. Pub. Health 10:865), being a very common occurrence in that country during the entire nineteenth century and the first half of the twentieth and was so serious that a law was passed in 1820 making it reportable. For a long time it was thought to be gotten only from meats, as the most common source of the outbreaks was sausage. In the United States it has only been recognized as a distinct disease for about twenty years but, doubtless, there were, long before this time, many cases diagnosed as ptomaine poisoning which really were due to the ingestion of foods containing the toxin of bacillus botulinus. The causative organism of the disease was not known until 1894, when Van Ermengem succeeded in isolating it from a ham which had given rise to twenty-three cases and three deaths. It is now known that there are three types of these bacilli, A, B, and C, and it has also been definitely shown that meats are not the only source of the disease, for Dickson has studied fifty-four cases, of which the majority were due to the use of vegetables and fruits (Monograph No. 8, Rock. Institute). These articles of food are contaminated by the spores some time before or during the process of canning and are usually not heated hot enough to destroy the spores, which germinate in the can of food during the period of storage and so find ideal conditions for their development and toxin formation. Herein lies a danger from the cold-pack method of home canning, as Dickson points out in one of his articles (J. A. M. A. 69:966).

Up to June 30, 1921, there were 54 recorded human outbreaks of botulism in the United States, of which 38 were due to preserved fruits or vegetables (Am. J. Pub. Health 10:866). Since that time other outbreaks have occurred, so that to date approximately two thousand cases have been recorded.

The mortality from this disease has been higher in the United States than in Germany, being about 68% as compared to approximately 16%. This is at least partially explained by the presumption that only the severe cases have been recognized and reported in the United States, while in Germany, where the disease has been known so long, practically all the outbreaks have been reported. Another explanation of this difference in mortality rates is the fact that the probability of the food's being cooked or partially cooked was greater in Germany because of the nature of the foods involved. American outbreaks have been due mainly to foods served without cooking such as salads, desserts, canned fruits and vegetables, and the like.

The toxin has been said to be powerful enough to cause death by a single tasting of the contaminated food. (Geiger, Am. Jour. Pub. Health 14:309). Its presence is not always suspected from the smell or appearance of the food when removed from the container, although in most cases there are signs of spoilage, and if the food is warmed the intensity of the odor is decidedly increased and is quite obnoxious. The taste usually does not suggest anything very bad, yet it has a sharp acid taste in most cases. Not only is the toxin deadly for man, but it has been shown by Dickson, Buckley and Shippen, and Graham to be so to many of the lower animals. Limberneck in fowls, and forage poisoning of horses, mules and cattle have been shown by the workers named above to be the result of the ingestion of the toxin of this organism. The former has been used in a few cases as a warning, or a forerunner, of human outbreaks, and some authors have held the opinion that this fact can many times be taken advantage of in an early diagnosis and so help attain better therapeutic results.

Prevention is not difficult and is accomplished by heating all foods to 120 degrees C. for one minute while canning, or by the destruction of any and all foods showing signs of spoilage, and by heating to the boiling point all foods before serving, as this will destroy the toxin.

Another type of food poisoning from the ingestion of a poison formed outside the body is ptomaine poisoning, but this is so rare. (Jordan, "Food Poisoning") as not to be deserving of any lengthy discussion. It is due to a poison formed during the process of disintegration of proteins, but there seems to be almost no evidence to show that it is at all common, despite the fact we are in the habit of using certain of our foods in at least a partially decomposed condition, although we call them ripened foods. None of these have caused any ill results.

Mussels are sometimes cited as an example of this type of poisoning, especially those that have been transferred from sea water to inland streams or pools. This, however, is disputed by some who claim that these creatures normally possess a harmful substance in their tissues, and by still others who say that the mussels are contaminated in the stream to which they are taken.

Of the outbreaks of food poisoning from the use of foods containing pathogenic organisms of the so-called paratyphoid-enteritidis group, paratyphosus B and bacillus enteritidis are the most commonly encountered, although bacillus suipestifer and bacillus proteus are thought by some to be the causative organisms. In England most of the recorded outbreaks seem to have been due to these organisms, most commonly gotten from meat of animals emergency killed, or from animals which were carriers of them. The infected animals were killed and the meat sold at a lower figure to prevent total loss to the owner, a practice especially common on the continent where Germany suffered most from it. Outbreaks from this type of meat seem to be due to the presence of bacillus enteritidis. In the cases of food poisoning from the use of foods contaminated before or during preparation for human consumption, paratyphosus B seems to be the chief one incriminated. In the United States cases of poisoning from this group of organisms are relatively rare, although it is possible that there have been outbreaks of this nature which were diagnosed as ptomaine poisoning and so recorded.

Bernstein and Fish (J. A. M. A. 66:167) reported an outbreak of food poisoning in Westerley, Rhode Island, during July, 1915, involving about sixty persons, with four deaths, due to para B in pie which they had secured at a restaurant in Westerley. Levine and Eberson (J. Inf. Dis. 18:167) reported an outbreak in Ames, Iowa, which occurred along a particular milk route and was due to para B. Ten cases developed, seemingly, from contaminated milk distributed by a dealer whose family had been suffering from what was at the time called typhoid, but which very probably was paratyphoid, for fecal examination at the time of the outbreak showed this organism to be present in members of the family and also in the cases along the milk route.

Outbreaks from para B have been much more common in some of the foreign countries than in the United States, especially in Germany. Savage (J. Hygiene 17:460) cites an example of an enteritidis outbreak in Brighton, England, during November, 1917, involving twenty-eight persons and due to the eating of fried fish which had been contaminated by a carrier. McWeeney (Brit. Med. J. I:1171) describes an unusually large outbreak of bacillus enteritidis food poisoning in an industrial school for girls in Limerick, Ireland, involving seventy-three persons and resulting in the deaths of nine, all due to the eating of a beef

stew. The meat was from a privately slaughtered animal and the condition of the animal before killing could not be determined but, since it was purchased at a low price, the inference would seem to be that it was of poor quality.

While there have been many more outbreaks of food poisoning from this group of organisms that could be cited, the ones above mentioned are sufficient to illustrate the two most common types and exemplify the two most important modes of infection, viz., infections from contaminated food and from meats of animals themselves suffering with infections.

The prevention of food poisoning outbreaks of this nature seems in itself very simple but to apply it efficiently and practically is not easy. No meat from diseased animals should ever be permitted to be sold. To accomplish this it would be necessary to have a very rigid inspection of all animals before killing and to carefully scrutinize all the meat after the slaughter. Emphasis must continually be laid on the fact that meat and especially milk that is derived from normal appearing animals may nevertheless be shown to contain organisms capable of bringing about gastro-enteritis disturbances. Under the best of inspection it is not possible to detect infected meat or milk in every case, although the chances for such to pass unnoticed are reduced to a minimum. The second measure of safety—and by no means an unimportant one—is the proper and thorough cooking of all meats, especially sausages, hamburger, etc., as these are made from the parts most likely to be infected with pathogens. Any individual who uses animal products rare or uncooked is subjecting himself to needless and dangerous risks. A third, and rapidly developing, factor in keeping down the incidence of especially the para B type of poisoning is the immunity set up in the human body by the use of the polyvalent typhoid vaccine.

Further than the means above mentioned the prevention lies with those who are handling the food. So matters of cleanliness and common decency are to be observed, and if observed, the time, expense, and inconvenience of isolating carriers will be saved.

Recently it has been shown that certain persons have a hypersensitivity to certain proteins and so always show quite well marked reactions to these when ingested or given hypodermically, although not always of a serious nature. The sensitization may be natural or acquired and in the latter case may be due to absorption from the digestive tract. Infants are found who are hypersensitive to cow's milk, and egg albumin is known to be poisonous to some individuals. Meats, fish, clams, lobsters, cheese, strawberries, and buckwheat are also known to be the cause of anaphalactic reaction in persons susceptible to them. Asthma in some cases, and some of the chronic skin diseases, such as

eczema, perhaps psoriasis, and certain forms of erythema and urticaria are caused by hypersensitivity to certain proteins, (Osler, "Principles and Practices of Medicine"). Hay fever is probably the best example of hypersensitiveness, its exciting agent in most cases being the pollen of some plant.

The prevention of this type of poisoning is in most cases not very difficult because the person so affected is usually aware of the fact and thus can avoid using this particular article of diet. In others desensitization is possible if the patient is properly treated. If the person is not aware of the condition, or is too young to know or tell it, then skin reactions are a very reliable means of detecting it, since there is always a definite reaction to injections of solutions containing the partcular protein (Kolmer, "Infection, Immunity, and Specific Therapy").

PRINTING AS A SUBJECT IN THE SCHOOLS

By MERRITT W. HAYNES

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During the last fifteen years instruction in printing has been introduced into more than two thousand schools throughout the United States and Canada. This represents an investment of at least a million dollars and affects the instruction of more than fifty thousand students. Let us inquire into this new phase of educational effort, to consider the motives and the reasons underlying it, and to weigh the values inherent therein, thereby to judge whether the labor of instructors, the time of pupils, and the expense to the public really justify this work.

This subject at once involves two great agencies, the printing industry and the public schools. A logical procedure in making the study is to hear the testimony and opinions of representatives of both of these agencies, taking them in order mentioned.

From The Standpoint of The Printing Industry

In the printing industry we will find the so-called practical printer who at the very first suggestion of teaching his craft in the schools imagines the training of an oversupply of workmen to compete with him for employment, thus reducing wages and thwarting his efforts to secure better working conditions. When he gives more rational second thought to the matter and is shown that printing instruction in the schools never has worked out in this way and never can, that it is conducted for its cultural and educational values, and that it ultimately reacts wholesomely upon the trade, his objection is withdrawn.

We will also find the proprietor of the small plant who suspects that the school printshop is installed for the purpose of doing the printing for the school board, much of which has formerly come to him. His fear is allayed when he finds that most of the job printing done in the school plant is created within the school primarily for instruction purposes, and would never be done if it had to be sent to a commerical shop.

Then there is the broad-minded proprietor who sees beneath the surface and beyond the present. One of his great difficulties lies in the ignorance of customers concerning the processes involved in any job of printing and their low standards of typographical taste. This printer sees in the school printshop a means of training up a generation of more discriminating buyers of printing who will insist on a better quality. He recognizes that every child who is taught in our schools to

read thereby becomes a consumer of printing. Through instruction and practice in elementary typesetting and platen presswork, he sees the possibilites of inculcating in children some knowledge of the technique of printing and the cultivating standards of good typography.

To accomplish this, the subject should be taught largely from the standpoint of developing appreciation of printing by enabling pupils to recognize the details that make up good typography— the style and arrangement of type, the stock on which it is printed, and quality of presswork and binding. The instructor who can attain this end must himself be a good craftsman capable of analyzing a printed specimen, of recognizing its excellencies and its faults, and of understanding the cause thereof. By pointing these out to his students, by exhibiting specimens of both good and poor typography with clear analyses of each, by encouraging pupils to analyize and judge printed work, and by having them do much work in resetting such specimens in good style, a good instructor can instill into his students a more refined taste so that they will demand better printing when they have occasion to buy it in any form, whether as books, magazines or newspapers, or in ordering special printing jobs. Certainly every child should be taught to scorn closely printed text in fine type with crowded margins, bizarre or gaudy display, smudgy or faint ink, and cheap inappropriate stock. Pupils can be trained to prefer printing that is in good taste in both type arrangement, stock, color effect, and presswork.

One will ask, "Why can not the art teacher develop this sense of critical taste without the expense of a printing equipment?" There should be the closest co-operation and sympathy between the printing teacher and the art teacher in order to emphasize the principles of balance, proportion, rhythm, harmony, contrast, and others that are common to both drawing and typography. The art teacher, however, does not deal with the details that must be understood in order to appreciate good typography. A few exercises in setting type into forms, then examining, criticizing, and improving until satisfactory proofs are obtained, will do more toward developing typographic taste than can ever be accomplished by drawing alone.

The printing industry therefore has vital interest in the teaching of printing for the purpose of developing critical appreciation of good typography on the part of the great mass of the public who are not producers of printing, but are consumers of printed products.

But this interest of the printing industry is mercenary. It is frankly, a desire to sell the kind of printing that makes better business. It may be justified on the grounds of art appreciation, esthetic satisfaction, the choice of beauty rather than ugliness, and the wholesome effects thereof on human character. This alone is sufficient ground for the teaching of printing in our public schools.

From The Standpoint of The Educator

Having considered the interest of the printing industry, let us now hear from the school man. Among professional educators we have several types. There is the classical man, the psychologist, the sociologist, and the practical school administrator. Let us seek the opinion of each of these on the values to be derived from instruction in printing in the schools.

The classical man, if he considers the subject logically, traces the evolution of the printing craft from its inception. He finds that printing originated as a means of duplicating and manifolding the work of the scribes of scholastic times. These scribes were the conservers of the learning of their time. The art of printing sought merely to imitate their product and utilize all their graphic devices for rendering written language. The early printers were all scholarly men and printing has always been vitally associated with scholarship. It is strange indeed that some dynamic school man did not long ago recognize the possibilities of instruction in printing as a means of teaching the mechanics of langauge—correct punctuation, capitalization, paragraphing, division of words, and spelling—and the effective rendering of written speech by means of the printed page. Printing is a most natural adjunct of language teaching.

This classical man will also appreciate the cultural value of printing by reason of its association with the great men and movements of modern history. Such names as Caxton and Benjamin Franklin dignify the industry and give it a reputable standing. The art that had more influence than any other in overthrowing feudalism and in spreading democracy throughout the world; the art that hands down to posterity every important event, that immortalizes the actions of the great and good, that can influence the behavior of men in manifold ways for untold generations to come; the art preservative of all arts— surely this noble craft possesses cultural associations that demand for it more than a mere reading acquaintance, and the wonder is that printing was not long ago introduced into the schools on a purely cultural basis.

A new type of school man has superseded the classical man. We call now for the testimony of the education psychologist who has recognized the one-sidedness of purely academic training and has discovered the importance of manual activity as a correlative of mental process. Out of this discovery has come the manual training movement.

In the elementary schools, manual training originally consisted chiefly of woodworking because one of the early exponents of this movement was a Swede who, being a woodworker, probably by heredity, worked out his pedagogy of manual activity in terms of woodworking. It is not presumptuous to say that had Otto Salmon been a printer rather than a woodworker, his sloyd system would prob-

ably have been developed through the use of type, ink, and paper rather than through the tools and materials of woodworking. One of the early American champions of the manual training movement, Dr. Calvin M. Woodward, said: "The value of a branch of study in a scheme of education must be determined by considering its influence in the connection in which it is placed. One of the great functions of manual training is to throw light on the subject-matter of other branches. It is really a sort of general culture which acts beneficially on every other branch." There is but slight relation between some manual arts subjects and the academic work of the school, notwithstanding the laborious efforts at "correlation" on the part of manual training teachers. Several industrial subjects were injected into the schools, whereas printing, so vitally correlated with the book work and so inherent in scholastic studies, was for several years omitted; but recent recognition of its intrinsic values has led to its rapid introduction.

Most of the well-known arguments for manual training, usually given in support of other subjects, apply with equal force to printing. It provides the necessary physical exercise to stimulate and balance the mental processes; it develops co-ordination of eye and muscle; it affords opportunity for self-expression; it trains in habits of neatness, order, and system; it satisfies the instincts of manipulation, construction, self-assertion, acquisition, proprietorship, and co-operation; it affords unusual opportunity for cultivating the power of perception; it emphasizes the importance of exactness, precision, uniformity, and suitability; it cultivates the esthetic sense through the inherent principles of balance, proportion, harmony, contrast, and color.

The psychologist, in making a critical analysis of the equipment and processes of printing with reference to their educational value, recognizes their simplicity. The supply of type is kept in cases with compartments of uniform plan. But few tools are needed—galley, composing stick, imposing table, chase, press, and paper cutter. The routine of operations is simple—placing the types in the stick, transferring the composed type to the galley, thence to the imposing table, where it is locked in the chase by means of furniture and quoins, then placed in the press where a film of ink is applied to the type-face by means of the rollers, then the paper is impressed against the inked type-face, and after the ink is dry the stock is folded and trimmed, and the printed job is delivered. This is the routine of every job of printing. It involves a maximum of mental excercise at every stage, requiring a high degree of judgement, but there is sufficient physical activity to be a relaxation from the tedium of academic work. The range of skills required to produce a simple job of printing can be learned in a relatively short time compared with the learning of such highly developed trades as pattern making or machine-shop practice,

although considerable repetitive exercise and practice are necessary to produce journeyman proficiency in these skills.

Each new job of printing, whether a card, a single-page sheet, a folder, a pamphlet, or a book involves a new set of problems to be solved in its production, and the solution of these problems presents much opportunity for mental development on the part of pupils. The natural (not forced) correlations with the academic work of the pupils are very evident. Arithmetic is used in calculating the size, measure and area of the type, the size and quantity of the stock, the keeping of time records during the process of the work, and computing the value of materials, time, overhead, and total value for the completed job. Grammar and rhetoric are employed in setting type from copy and in reading and correcting proof. Science enters into the study of the materials used—ink, paper, glue, etc. Mechanics is involved in the processes of inking, presswork, folding, trimming, and binding. A study of geography is made in considering the sources and preparation of the materials used. History comes in when the pupil studies the romantic story of the invention and development of the art of printing and its place in human civilization. A vital study of civics is made in considering the influence of printing in our daily lives by means of newspapers, books, business forms, and advertising matter. A practical study of economics is effected in studying the source and cost of materials and the distribution of the product.

Along with the educational psychologist whose research is intensive, we have also the educational sociologist whose view is extensive and who considers each subject of instruction with reference to its place and influence in human civilization as a whole. What is his evaluation of the school printshop?

This type of educator has weighed very carefully the former aims of education—culture, harmonious development of all the faculties, preparing an individual to make a living, and mere knowledge—and accepts the social aim; that is, he regards education as a preparation for intelligent activity for the common good. He is therefore interested in the means of promoting the interests of society as a whole, realizing that the interests of the individual depend upon the welfare of the group. He recognizes that in addition to the primary animal necessities of food, clothing, and shelter, civilized society requires a fourth essential—communication; and that printing is the greatest means of communication that mankind has yet devised.

The school as a means of social training should reproduce, within feasible limits, the world in which children are to act and serve, in order to prepare them for such service by preliminary practice in the kind of activities that they will later be called upon to pursue. This social argument has brought into the schools the shops and labora-

tories in which the pupils through participation in simulated adult activities learn how to provide the necessities of food, clothing, and shelter. Surely the school as an agency for social training should provide for experience in the operations of one of the greatest of all social instrumentalities, the art of printing. How can the exalted human necessity of communication be taught without an actual printing press in the school, by means of which pupils can carry on the kind of communication which has contributed so largely to the development of civilization? Printing, therefore as a socializing factor fits naturally and essentially into the modern social aim of education.

We have now to consider the viewpoint of the practical school administrator, the superintendent of the city school system or the principal of a school. If this official be actuated by a narrow, mercenary attitude, he may see in the school printshop a means of reducing his printing bills by exploiting student labor and imposing upon a timid or unsophisticated printer whom he engages as the teacher. This undesirable situation is usually overcome in due time through the action of a number of interested agencies in the community. The school printshop must be justified on purely educational grounds, or it should not exist.

Comparison of Installation and Maintenance Costs

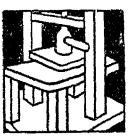
The school administrator is vitally concerned with the matter of the budget. He is therefore gratified to learn that, as a manual training subject, printing compares favorably with other forms of shop work, not only in its educational possibilities, but in the matter of expense as well. The cost of a printing outfit for a school shop, provided it be not "overequipped and undertaught," is no greater than that of an equipment for woodworking, electric wiring, machine-shop practice, or any other of the common branches of shop work that have been introduced into the schools. Nor is the cost of maintenance of a printshop greater than for any other shop; in some cases it is much less. The cost of paper and ink is considerably less and more stable than the rapidly increasing cost of lumber for woodworking.

Summary

Recognizing all the psychological and social values of printing already mentioned, the school administrator sees in this department a means of promoting the varied activities of his school which is rapidly becoming a miniature world of multifarious social, industrial, and commercial enterprises. The production of posters, tickets programs, and menus for various school events, and the printing of a school publi-

cation, instruction sheets, and the like, facilitate these activities and provide many valuable lessons in co-operation and social service.

We have not mentioned the vocational values of printing in schools; that is a subject outside of our present field of inquiry. We have, however, found sufficient educational value from every standpoint to justify printing as a subject of instruction. But notwithstanding the possibilities of the subject, its values can not be secured unless it be taught by a teacher who is fully aware of these values. He must have a vision of the importance of the printing industry, of his opportunities for developing in his pupils an appreciation of good typography, and of the social implications of the "art preservative of all arts."



KANSAS STATE TEACHERS COLLEGE

Pittsburg, Kansas

ATHLETIC RECORD FOR 1927

BASKETBALL (Conference Champions)

K.S.T.C., Pittsburg			K.S.T.C., Pittsburg		
33	Bethel	19	37	Wichita U.	24
24	*St. John	17	25	Wichita U.	27
25	Southwestern	16	30	Bethel	25
28	*Okla. Aggies	25	34	Ottawa U.	22
33	*Okla. Aggies	30	22	St. Benedict's	20
37	Ottawa U.	16	28	Hays Teachers	20
35	*Springfield, Mo., Teachers	23	29	Hays Teachers	24
35	Bethany	24	35	*Springfield, Mo., Teachers	38
21	Bethany	19	34	C. of E.	31

Points: K. S. T. C., 545; Opponents, 420

* Non-conference.

WRESTLING (Conference Champions)

K.S.T.C., Pittsburg			K.S.T.C., Pittsburg		
15½	Emporia Teachers	11½	20½	Emporia Teachers	4½
18	C. of E.	15	26	C. of E.	5

Points: K. S. T. C., 80; Opponents, 36

TRACK (Conference Champions)

Kansas University Relays: Two-mile relay, second place; half-mile relay, third place; one-mile relay, second place; medley relay, fourth place; javelin, fourth place.

Oklahoma University Relays: Placed second in meet.

Drake University Relays: Half-mile relay, first place (only entry).

Dual Meets: K. S. T. C., 91; Springfield, Mo., Teachers, 45.
K. S. T. C., 71½; Emporia Teachers, 59¼.

State Conference Meet: K. S. T. C., first, 45; Baker University, second, 27½.

FOOTBALL

K.S.T.C., Pittsburg			K.S.T.C., Pittsburg		
32	Friends U.	0	31	Ottawa U.	6
57	St. Benedict's	0	0	Emporia Teachers	13
6	Wichita U.	0	13	Hays Teachers	7
0	C. of E.	20	14	*Tahlequah., Okla., Teachers	0

Points: K. S. T. C., 153; Opponents, 46

* Non-conference.

Out of 33 Team Contests, K. S. T. C., Pittsburg, Won 29

This College Offers a Degree Course in Physical Education and Coaching