people and insists upon its own way. Such persons are motivated by a single idea and will often perish rather than give it up. It will be a long time before it will be content to govern just itself.

Russia is physically a strong young man who has just passed through the throes of puberty. There has been much internal conflict with emotional discord, unsettledness of purpose, vague ideals and dreams, reckless pursuit of a shadowy goal without much consideration to the practical obstacles. With the passing from the stage of puberty into the stage of adolescence it begins to develop more and more sense. It is still, however, far from leaving the impractical idealism of the youth. Age may give it wisdom.

China reminds me of a middle-aged, bald-headed man who once was very fat but now has become gaunt and has large hanging folds of skin. He is essentially lazy, calm, philosophical, and would rather spend his days fishing than working in the field. He is a kindly old soul who wishes to be left alone and desires not to interfere with other people. There are some signs, however, of his becoming very irritable at the persistent stings given him by the irascible, small, psychopathic neighbor. He will lose his temper some day and chastise this neighbor. The irritation will make a man out of him, so that after getting rid of it, he will settle down to a more organized and systematized life.

England is a solid, settled business man who has just gone through a depression and has "taken it like a man." However, because of his age, near the sixties, he is conservative, somewhat apprehensive, wishes to let things take their course, and does not desire to interfere with the ordinary plan of things. He has a large background of experience, knew what it was to be the head of a large firm and still has many potentialities. It remains to be seen whether age will get the better of him. He has become "too set in his ways" and needs to change. He has many grown-up sons, some of whom are stable, some of whom are unstable, but practically all of whom are wilful. These colonies take after their parent in some ways.

The only really normal countries in this world to-day are Norway, Sweden, Denmark, Holland and Switzerland.

Holland is a calm, placid, peaceful man of middle age who goes his own way, minding his own business, working industriously, taking care that his toes are not particularly stepped on, but free from any real hysteria.

Norway and Sweden similarly are hard-working, clean citizens who wish only to be let alone, to cooperate in the community singing group and to be allowed to earn an honest living.

Switzerland also is normal but quite uneasy because of his neighbors. There are signs of insomnia and general restlessness.

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RATE OF REACTION AND CONCENTRATION OF ENZYME

THE note by Dr. Oscar Bodansky in the July 16 issue of SCIENCE concerning the invalidity of the widely accepted "Schütz-Borissov Law" for the relation between rate of reaction and enzyme concentration recalled some work[1] on this subject by some colleagues and myself which seems to have been not at all noted by chemists. Dr. Bodansky points out that while the Schütz-Borissov law is to the effect that the velocity of reaction is proportional to the square root of the concentration, the velocity is actually proportional to the first power.

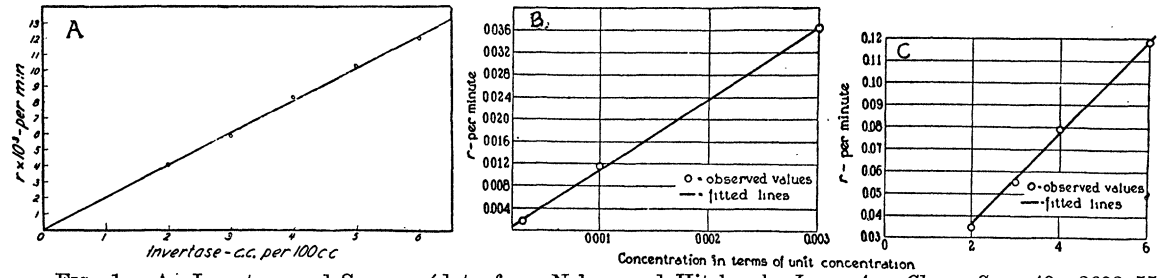

FIG. 1. A. Invertase and Sucrose (data from Nelson and Hitchcock, *Jour. Am. Chem. Soc.*, 43: 2632–55, 1921). B. Urea and Urease (data from Van Slyke and Cullen, *Jour. Biol. Chem.*, 19: 141, 1914). C. Dipeptid and Enzyme (data from Abderhalden and Michaelis, *Zeits. Physiol. Chem.*, 52: 326, 1907).

Our work was concerned primarily with the testing of a proposed equation for describing the course of the reaction between enzyme and substrate. One of the parameters of the equation measures the rate of reaction, and incidental to our work we studied the relation of the rate so measured to the enzyme concentration. Our results clearly support Dr. Bodansky's

[1] J. Berkson and L. B. Flexner, *Jour. Gen. Phys.*, 11: 433, 1928. J. Berkson and F. Hollander, *Jour. Wash. Acad. Sci.*, 20: 157, 1930.

contention that the relation is linear. This can be shown graphically, as illustrated in Fig. 1.

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PEANUT "POUTS"

MANY years ago my attention was called to a condition of peanut plants which resembles very closely a condition known in potatoes as tipburn. Associated with the peanut plants showing this condition was the common potato or bean leafhopper (*Empoasca fabae* Harris). At that time I surmised that this disease was similar to potato tipburn and was caused by the leafhopper. Other duties prevented any more work on the problem until last year. This past season, laboratory and field experiments have proven beyond a doubt that the disease which is known locally as "pouts" is caused by the common potato or bean leafhopper. This disease appears first as a distinct blackish discoloration at the tip of the leaflet, and the discoloration progresses gradually toward the base of the leaflet until the whole leaflet is involved. If the disease is severe, the entire leaf turns blackish, shrivels and dies. Typically, in the field, the plants recover about blooming time and there is no further evidence of the disease. At this time also, the leafhoppers disappear from the peanut field and seem to migrate to the fields of soy-beans. Although we have not as yet been able to prove this migration in the field, all the evidence points in that direction.

In the field plants which were protected from the leaf-hoppers the disease did not develop, whereas unprotected plants did develop the disease. Plants in the field which had the disease and which were freed from leafhoppers and protected by cages recovered. Diseased plants moved from the fields to the laboratory freed from leafhoppers and kept free recovered rapidly and made normal growth. Plants which were not freed from leafhoppers continued to show the effects of the disease and if the number of leafhoppers was large, the plant was killed outright. In the laboratory we have shown that the disease known as "pouts" is caused by what may be termed the mass effect of toxins. In the laboratory small plants, with two leaves, which were in good growing condition and which were stimulated by plant food and frequent waterings were able to outgrow the effects of one or two leafhoppers per plant. Those, however, which had three or more leafhoppers per plant did not recover and were killed, thus showing the mass effect.

The name "pouts" was given to this disease by the farmers because they said the peanut plant was "pouting" and after it commenced to bloom, it ceased to "pout." The name is, therefore, very appropriate and should be used to designate this condition of the peanut plant.

Thus we add to the long list of the host plants of this leafhopper still another important economic crop, for it has been shown in the past or experiments are now in progress which indicate that this insect is an important pest of alfalfa, clover, garden beans, soybeans, beets, potatoes, cotton and peanuts.

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DATA ON FORAMINIFERA COLLECTED BY THE WORKS PROGRESS ADMINISTRATION

DATA on more than 15,000 genera and species of foraminifera, including 45,000 illustrations, are to be available for the information of geologists, engineers and other scientists as a result of work now being done by the Geological Research Project of the Works Progress Administration in New York City. Substantial progress toward the completion of the gigantic task of assembling this material has been reported to the Washington, D. C., office of the Division of Women's and Professional Projects of the Works Progress Administration. Ellen S. Woodward, assistant WPA administrator, is director of this division.

Results of the project are expected to be of material benefit to geologists, to the mining and petroleum industries and to those engaged in city planning, in agriculture and in the control and development of waterways. The project's manuscript has already been used in connection with the solution of problems in rock layer relationship for the American Museum of Natural History.

Workers on the project are collecting material on foraminifera never before assembled in one place. Shells of these microscopic, single-celled animals are found in the rock layers making up the outer crust of the earth. Through identification of the tiny fossilized remains, an estimate can be made of the type of rock and soil to be encountered in drilling or excavating operations. They serve the geologist or the engineer as the x-ray serves the surgeon.

In both the pure science of geology and its various applied forms, one of the most important considerations is the age of the different rock layers and their arrangement in relation to each other. Of the several ways in which ages and relationships can be determined by far the most accurate method is by means of animal remains embedded in the rocks. These animals lived in the ancient seas during the geologic age in which the particular rock layers were formed. Certain species of fossils occur in rock layers of a particular age, regardless of the geographic location of the rock formations. By identifying the animal re-